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TRANSACTIONS

OF THE

National Dental Association

AT THE

FOURTH ANNUAL SESSION,

HELD AT

Old Point Comfort, Va.,

COMMENCING JULY 10, 1900.

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CONTENTS.

Page.

Disclaimer ii

PRESIDENT'S ANNUAL ADDRESS 1
Discussion on President's Address 11

PAPERS.

SECTION III.—OPERATIVE DENTISTRY, MATERIA MEDICA, AND THERAPEUTICS.

Paper by C. N. Johnson, of the Section 22
Paper by E. K. Wedelstaedt, of the Section 41
Paper by L. G. Noel, of the Section 49
Paper by Joseph E. Wilkinson, of the Section 57
Paper by A. C. Brewer, of the Section 60
Remarks on Rapid Method of Pulp Extirpation, by E. T. Darby 64
Remarks on Measuring Hand Pressure in Packing Gold, by G. V. Black 64

SECTION V.—ANATOMY, PATHOLOGY, AND SURGERY.

Paper by Alton H. Thompson, of the Section 69
Paper by W. H. G. Logan, of the Section 83

SECTION I.—PROSTHETIC DENTISTRY, CROWN- AND BRIDGE-WORK, METALLURGY, CHEMISTRY, AND ORTHODONTIA.

Paper by Mary E. Gallup, of the Section 106
Paper by W. E. Griswold, of the Section 127
Paper by Nelson T. Shields, of the Section 133
Paper by Frank G. Gregory, of the Section 141
Paper by W. Storer How, of the Section 144

SECTION II.—DENTAL EDUCATION, LITERATURE, NOMENCLATURE, HISTOLOGY, AND MICROSCOPY.

Paper by M. F. Ault, of the Section 154
Paper by L. Ashley Faught, of the Section 169
Paper by J. Percell Corley, of the Section 176
Voluntary paper, by Samuel J. Cockerille 179

DISCUSSIONS.

Inlays, their Advantages and Limitations—discussed by

Dr. W. V-B. Ames 28
Dr. E. T. Darby..... 31
Dr. G. V. I. Brown 33
Dr. R. Ottolengui.... 34, 36, 38
Dr. C. N. Johnson..... 36, 40
Dr. C. S. Butler..... 36
Dr. J. Y. Crawford..... 37
Dr. J. N. Crouse..... 38
Dr. M. L. Rhein..... 39

A Method of Preparing Distal Cavities in Cuspids—discussed by

Dr. C. N. Johnson 44, 45
Dr. Wedelstaedt 45, 48
Dr. Fillebrown..... 47
Dr. Weeks..... 48

Painless, Rapid Method of Pulp-Extirpation—discussed by

Dr. Ottolengui 65

Measuring Hand Pressure in Packing Gold—discussed by

Dr. Crouse..... 67, 68
Dr. Black..... 67, 68
Dr. Waters..... 67
Dr. Ottolengui 67
Dr. Crawford 67, 68

The Evolution of the Complex Molar—discussed by

Dr. Barrett..... 77, 80, 81, 82
Dr. Patterson..... 80, 81, 82
Dr. Claude..... 80, 81, 82

Antiseptic Surgery of the Mouth and Face—discussed by

Dr. Rhein 87
Dr. Claude 89, 104
Dr. James Truman 90, 92
Dr. Brophy 92, 98
Dr. G. V. I. Brown 94
Dr. Crawford 96, 97
Dr. Logan 97, 105
Dr. Geo. W. Cook..... 99
Dr. T. B. Hartsell 101
Dr. V. H. Jackson 103

Art in Prosthetic Dentistry—discussed by

Dr. C. S. Butler 111
Dr. Taft 113
Dr. Cravens 117
Dr. Geo. H. Wilson 117
Dr. Walker 120
Dr. R. H. Nones 121
Dr. Crawford 123
Dr. Gallup 125, 126
Dr. Ottolengui 125

Ideal Crown- and Bridge-Work—discussed by

Dr. Crawford 135
Dr. Shields 135, 137
Dr. Ames 137, 140
Dr. Goslee 138, 139
Dr. F. N. Brown 139
Dr. Griswold 139, 140
Dr. Crouse 140

MINUTES OF MEETING.

FIRST DAY—Morning Session..... 186
Report of Executive Council..... 186
Committee on President's Address appointed 187
Resolutions for appointment of committee to promote the teaching in schools of "Good teeth, good health."..... 187

FIRST DAY—Evening Session..... 187
Communication from American Dental Society of Europe..... 187
Report of Executive Council 188
Report of Chairman of Section III..... 188

SECOND DAY—Morning Session..... 191
Committee appointed to promote teaching in schools of "Good teeth, good health." 191
Report of Executive Council..... 191
Report of Committee on President's Address..... 192
Report of Chairman of Section V..... 194
Additional members appointed on Committee on History..... 196

SECOND DAY—Evening Session..... 196
Report of Executive Council..... 197
Committee on Necrology appointed..... 197
Report of Secretary of Section I..... 197
Committee appointed to see that the suggestions in the President's Address were carried out..... 198
Report of Executive Council..... 198

THIRD DAY—Morning Session..... 199
Amendments to Constitution adopted 199
Report of Executive Council..... 199
Courtesies of the floor extended to Dr. E. L. Oldfield, of Melbourne, Australia 200

THIRD DAY—Evening Session..... 201
Report of Executive Council..... 201
Adoption of amendments to Art. III, Sect. 3 and Art. IV, Sect. I of Constitution 202
Rejection of proposed amendment to Art. VI, Sect. 2 of Constitution 202
Chairman of Committee on Clinics makes his report 202
Brief verbal report made by Secretary of Section II..... 203
Additional members appointed on Committee on Army and Navy Legislation 204

Time and place of next meeting decided..... 204
Election of officers..... 204
Election of Executive Committee..... 204

FOURTH DAY—Morning Session..... 205
Vote of thanks to Dr. J. N. Crouse as chairman of Executive Committee 205
Organization of Executive Committee..... 205
Assistants appointed to aid the officers of Section III. 205
President-elect conducted to the chair..... 205
Additional members to Publication Committee..... 205
Report of Chairman of Committee on Necrology 206
Minutes of Executive Council..... 211
Report of Committee on Essays..... 212
Report of Committee on Army and Navy Dental Legislation..... 212
Report of Committee on State Interchange of License..... 215
Report of Committee on History (second report)..... 223
Report of Committee on President's Address..... 225
Report of Treasurer..... 226
Report of Secretary of Section I..... 227
Report of Recording Secretary..... 229
Report of Corresponding Secretary..... 229
Resignation of Dr. J. Adams Bishop..... 229
Resignation of Dr. G. Lenox Curtis..... 230
Publishing of Transactions by The S. S. White Dental Mfg. Co., as heretofore, authorized 230
Resolutions regarding Dr. J. N. Crouse and the Dental Protective Association 230
Dr. Crouse's verbal report as President of the Dental Protective Association accepted 230
Resolution that appliances or instruments shall, before being exhibited, be presented to Chairman of Clinic Committee..... 230
Remuneration of Recording Secretary..... 231
Dismissal of charges against Dr. J. N. Crouse..... 231
Report (preliminary) of committee appointed to carry out suggestions in President's Address..... 231
Order on Treasurer for expenses incurred in connection with Army and Navy Bill 232
Report of Publication Committee..... 232

APPENDIX.

Ex-Presidents of the American Dental Association..... 234
Ex-Presidents of the Southern Dental Association..... 235
Officers 236

Executive Committee 236
Executive Council 236
Organization of the Sections 237
Constitution 240
Rules of Order 248
Order of Business 249
Standing Resolutions 250
Code of Ethics 252
List of members of the N. D. A. 254
List of "permanent members without dues" 262
List of surviving charter members of the Southern Dental Association 262
States represented by membership in good standing 263

ANNUAL ADDRESS.

By B. HOLLY SMITH, President.

MEMBERS of the National Dental Association: I greet you with feelings of congratulation and pleasure on this the occasion of our fourth annual meeting. Although such a short time has elapsed since this organization was effected, it has been sufficiently long for us to see the Association grow into the confidence and esteem of the entire dental world, and to hear on every hand expressions of hopefulness and encouragement. If I may speak for those who labored to form this society, I will say that even the most enthusiastic and sanguine did not look upon the original organization as the end of all to be desired, but simply as a faltering beginning of a concentration of influence and effort which would ultimately develop into a power for good indispensable to the dental profession. It never was thought that the plan upon which the organization was made was anything more than that most feasible for the time being. Many features at first considered essential had to be abandoned because of differences of opinion. The chief desire of its founders and supporters was that it might survive for a year or two without serious friction or rupture, until confidence was strengthened and generous co-operation assured.

It is undeniable that in this, as in all new enterprises, objections both to the scope and plan of the work have arisen. Impatience and resentment toward those who would thus hinder our Association in its onward progress are unwise and ill-advised. Opposition must be met with hopeful tolerance and brotherly conference until we become indeed a unit in thought and purpose. The strong and lusty must not despise the weak and timid. This organization is

essential to the progress of professional interests and the development of scientific research. Let us cheerfully accord to it, therefore, our loyal support, and willingly make what sacrifices we are called upon to make for the advancement of its interests.

It is of vital importance to the purposes of this Association to establish and strengthen an influential, if not authoritative, relation between this and other dental organizations. The National Association of Dental Faculties, the National Association of Dental Examiners, the Institute of Dental Pedagogics, the branches, the State and local societies, should all hold allegiance to this body. Even though this allegiance would cost some slight sacrifice, it can be readily seen that the loyal union would strengthen immeasurably the influence and helpfulness of the thus-constituted parent organization; give force and power to its edicts both at home and abroad; make it a court of arbitration for the settlement of differences; assist its officers and commissions in the collection of statistics and data, and enable it to foster without hindrance research and investigation.

Unquestionably the reputation of American dentistry in foreign countries has suffered greatly in the past from misrepresentation and fraud, until to-day our diplomas and training are dishonored in most foreign lands. There is but one remedy for this, and that the sovereign balm for all jealousies and backbitings, that God-given beneficent influence which we call fraternity. Much might be done to strengthen this by the establishment of associate membership in this Association, a non-resident relation which might be tendered after correspondence to one or a number of members of the various foreign dental organizations, to be filled by election or appointment of these societies. This would put us in touch not only with the sympathies but the thought of our brethren in other lands. They might visit us, contribute to our work, and truthfully represent us in their localities. Especially should we invite those who speak our tongue to be represented. Americans in foreign countries might make the meetings of this Association the season of their home-coming. The Committee on Foreign Relations of the National Association of Dental Faculties and the American Dental Society of Europe have done some good work in this direction. We feel assured that if this work of fraternizing is diligently pursued, the day is not far distant when the American dentist will be

welcome the world over, and his achievements and accomplishments cheerfully acknowledged.

The meeting of the International Dental Congress in Paris next month would be a very opportune time for the promulgation by our committee of a desire on the part of this Association to establish permanent relations of affiliation with the various dental organizations of the world, and I suggest that a formal communication of this character be presented by the chairman of the committee.

The normal function of this Association, let us hope, will never cease to be educational. We do not believe, however, that the greatest good can be accomplished on the desultory lines of its present plan of work. The annual exhibition of papers and methods of practice cannot be dispensed with, but there must be co-ordination of effort. There must be appointed commissions, backed by the authority of the Association, to collect data, to prosecute research, and these commissions must be selected with a view to their special fitness for the task assigned. It is not enough that any ordinary dentist without special training or thought, but with commendable willingness, should read an amateurish essay before a section of this body, leaving the subject just where it was before, save for marks of a few drops of perspiration from the tyro; this is not the place for kindergarten work. Instead, the commission should have the time arranged for the presentation of a report of the year's work and correspondence of each member, to be followed by a succinct chart of essentials and deductions, the essence and outcome of the work of the year. This would be a peg from which to start succeeding efforts. Real progress could be made, and true knowledge gained. This desultory reading of papers on the same subjects, repetitions, last year, this year, and next year, the same thing over and over again, makes much reading a weariness of the flesh, and deprives our Association of any distinctive character. These commissions might be organized under the authority of the Sections, and their reports, when printed, would be more valuable than the text-books or works of reference, in that they would be the latest authoritative statement of the profession on the subject. They might include readily deductions from work done before other organizations without impairing their quality.

Too many papers are being published. The local society is the place for the nestling to try his wings, but too wide publication of

these trials results in confusion and deters progress. Not a year goes by that we do not see papers giving in minutest detail methods which were old twenty years ago. The preparation of such a paper was helpful perhaps to the author, and because it stirred the sympathy of the society for the essayist, bringing brethren in a common cause closer together, it is helpful generally. But must this be the representative literature of our noble calling? The dental journal publishing the proceedings of a dental society has difficulty in rejecting commonplace papers, but it ought to be a crime for a journal to reprint twaddle. It would be difficult to conceive the amount of energy and time which has been expended by misdirected members of our profession in rewriting and promulgating theories and methods of practice which to the initiated are old and often *passé*. If this organization through its organized effort will but settle some methods of practice, recognize some as superior, and denounce the spurious and false, order may be brought out of chaos.

In order to assure the successful performance of the work of commissions, it is important that a semi-annual report be made by the chairman of the commission to the chairman of the Section under which the commission is working. With a half-dozen or a dozen such divisions of our best workers so engaged, might we not, at the expiration of a year, be able to say as a profession what is true, what is false, what is advisable, what is to be avoided?

I would suggest the appointment by each of the Sections of two commissions of five members each. Let the chairmen of the Sections outline the scope and field of work. Let the commissions report unfailingly to the Sections at the annual meeting, and let the Association give time at least for the presentation before the general body of a *résumé* of this report.

This will insure activity all along the line, while under the present plan of procedure some Sections present no papers, possibly because of a fear that there would not be opportunity for all to be given a hearing. There certainly can be said to be no specific progress in such sections. Was not this organization effected for general usefulness and advancement? Should any Section lack a hearing? Through every ramification of this organization should beat a pulse whose systole should be felt by every member, and that without more than normal effort, if we will but put ourselves in

touch with the great heart of professional progress. Desultory and unorganized effort gains but meager results; organized and concentrated labor sweeps on to the vantage ground of assured and definite results.

I would suggest that a most fitting subject for the consideration of one of these commissions would be the preliminary training of the dental student. The dignity, erudition, and influence for good of our profession depend upon the character of men who are year by year added to our ranks. Without thought or study it is questionable whether as a whole we have any very definite idea of what is desirable preliminary training for an embryo dentist. Indeed, we believe seriously that if any concerted opinion were to be formulated from the preliminary tests which have been exacted or advocated it would be in error. Have we not been swept off our feet by such cries as "Elevate the standard of dentistry," "Is dentistry a learned profession?" etc., until mechanism and constructive power have been lightly regarded? Have we not erected an arbitrary and false division between mechanical ability and intellectual power?

In an experience of nearly twenty years as a dental educator it often has been a source of mortification to me that so many of the men who have had the advantage of extended so-called mental training, who possessed the degrees conferred by colleges and universities as an evidence of such training, made the most impossible of all material out of which to make dentists. Where could the fault be? Unquestionably in the character of the training. The motor centers had been neglected. Halleck says, "Youthful nerve-cells alone are easily developed by training; after twenty, ability comes through pain and trouble." Among the best all-around men whom I have helped into professional life, men of skill and sound judgment, have been watchmakers, and men who have served apprenticeship in machine shops, gaining a practical knowledge of the properties of metals and considerable manual dexterity in their management.

Our educational system has not yet awakened to the necessity for this kind of training. Our profession does not advocate it as it should. When on a visit of inspection to that magnificent Boston Institute of Technology, I inquired whether any dental students pursued preliminary studies there. The registrar informed me that he had never known such to be the case. There should be in such an institution a special course (perhaps shorter than any of

the regular courses) for the preliminary training of dental students, and there could be, I have no doubt, through the influence of a commission from this body. Our polytechnic and manual training schools throughout the country could be made to do good service if the proper interest were taken in them and a proper course outlined for them. A feature of such a course should be the training of the senses,—tactile, auditory, optical, and olfactory.

We really believe the better and wiser solution of this question of preliminary dental training to be not so much in the fixing of some arbitrary standard, more or less debatable, more or less to be evaded, more or less the subject of misapprehension and misrepresentation. We believe we should go to the root of the matter and decide not what particular things our candidate should know, but what, essentially, the character of his preliminary training should be, and that we should base our decision in this matter upon an honest and painstaking examination of the pedagogic principles involved. What these principles are, it seems to me, we are the better able to decide, because of the avowed dependence of psychology on physiology and the declared reliance of later psychologic authorities upon the study of the material structure and physiologic properties of the brain; the scientific examination of psychologic facts and tendencies after what may be called laboratory methods.

If, then, we, as men of knowledge, experience, and judgment, can decide in what course of training are to be found the most valuable forms in which the mental power of the student should be displayed, what is the character of training most advantageous to him, and procuring for him the greatest force in his profession, without narrowing or restricting his mental horizon, it is certainly our duty to recommend such a course; nay more, it is our duty to strive with all our might to secure the establishment of such a course. Moreover, I hold it a solemn responsibility, in view of our position and influence as a society, that we examine and investigate with industry and such ability as we may command all available sources of information upon this all-important subject.

Moved, therefore, by such considerations as I have submitted above, I desire to bring to your attention some extracts from the contributions of educators and psychologists upon *The Importance of Training the Motor Centers,* and, first of all, I beg you to reflect that this importance is considered by these authorities from a general and not a specific pedagogic point of view.

Primarily, the motor area of the brain is fully one-third of the entire area, and to fail to train this part, or to train it imperfectly, brings as its result and punishment the incomplete, incapable mental action and production; an exclusion of fully one-third of intellectual capacity, power, and enjoyment.

Beyond the positive loss resulting to the individual and to the world from untrained or imperfectly trained motor areas, measured we may say by dreary and expressionless blanks in positive accumulations of knowledge, experience, and power, comes the most important function of the development of these areas in their formative influence upon the development of the mental character as a whole. For it is clearly argued and well demonstrated that through the training of the motor centers the will, the judgment, and the memory are powerfully stimulated and developed.

Edward R. Shaw (*Pop. Sci. Mo.*, vol. l) says, "Heusinger regards the impulse to activity as the regulating principle in gaining knowledge, leading to deeper knowledge of the thing itself, and a greater appreciation of all in connection with the thing to be known, and excludes things having no relation to the particular object of thought."

Physical activity is the most marked characteristic of youth, and is due to the energy which must be expended through the motor channels.

The movements of young infants are at first impulsive, then reflex; stimulated by the senses, but without premeditation; and later voluntary movements are based on memory of these impulsive and reflex movements, hence the latter influence the will.

These impulsive and reflex movements are not noticed by self-consciousness, but leave a trace in the developing brain, and when hit on again and again produce an idea, a motor idea in the dawning consciousness. These motor ideas are the foundation of deliberative or voluntary movements, and so the will develops first through the motor side.

Not only do these motor centers play a great part in the development of psychic life and the use of the will, but all other parts of the brain come to be developed in connection with them.

According to Professor Baldwin, the motor element holds sensory elements together. Dr. Crichton Browne holds that we have few if any purely sensory characteristics.

Moreover, the muscles widen the field for sense impressions, and by the experience which their own activities involve expand our mental resources a thousand-fold.

Thus it is that certain ideas, as of time, place, position, and form, are, in their basic principles, motor. These develop and render accurate the judgment by multiplying opportunities for comparison and discrimination.

It can be readily shown also that through the motor side of the brain the attention is strengthened, and the power of association intensified. According to Professor Baldwin, association has a motor foundation, and elements are held together in memory because used together in action; and as the action becomes one, though complex, so mental content becomes one, though complex. As association is stimulated through the motor side, the memory is necessarily strengthened; in fact, memory is no longer considered a faculty which takes up a content and remembers it, but is now known to be a function of the content remembered. This function depends upon variety of association and upon volition, and both of these are best built up by that which gives the fullest possible functioning of the nervous mechanism during the developing period,—*i.e.*, the fullest and most varied use of motor activities warrantable. The influence of motor cultivation and development upon the memory is then indisputable.

Again, a proper expenditure of motor energies produces an emotional state of interest and pleasure, which of itself materially strengthens the memory and the association.

The general educational value of motor training, as thus attested by eminent authority, and as it appeals to our own experience and judgment, is incontestable. Such training cannot be open then, manifestly, to any charge of restriction or narrowness, inasmuch as it tends to develop and strengthen the mental equipment of the individual. For it is through this training that the will, the judgment, and the memory are strengthened and developed.

It seems to me that another consideration of the importance of training the motor centers arises from the peculiar benefits accruing to our profession from their fullest, most perfect cultivation. Aside from their pedagogic and psychologic value, the essential fact of capacities and powers which we may call specific and technical is to us all-important.

This training should be a most important factor of preliminary education, because the period of life in which this education should be acquired is the best adapted to its most perfect and complete effect. The formative period has not passed, and it is during this period that we may expect the motor ideas to become integral and generative, not accidental and barren. It is at this period the unconscious and subtle power must be acquired which afterward will flower into the consummate mastery of technique and manual skill. It is from preliminary training based along these lines we must hope for the production of the dental genius and master, for this it is which will make the foundation ideas of our profession so completely a part of their possessor as to seem innate and the sure basis of creative skill.

These in faint and feeble outline are some of the thoughts upon one very important factor of preliminary dental training, a factor whose importance I believe to be easily discernible, and of whose educational soundness we can have no doubt. That other requirements are also essential no one is disposed to argue. But I hope we are all enthusiastically disposed to act as a unit in securing as soon as may be the great advantages which will accrue to us professionally from a proper preliminary training of dental students, and that some active steps will be taken by this Association looking toward that important end.

To those of us who reflect upon the advancement in social and scientific position of our profession, it is unfailingly interesting to study the material welfare of individual members and to compare the opportunities for improvement along this line with relative callings. The profession of dentistry has grown into a position of assured appreciation, and yet our best men, as compared with men of like rank in other callings, are but poorly paid. This cannot be ascribed to individual lack of courage, but rather to a low general estimate by most of us of what compensation good attention should command. Fees lack uniformity often because of a failure to compare notes. Young men often skillful begin the practice of dentistry without any familiarity with custom in this direction. In many sections it is the custom to make no charge for treatment and consultation. It would be both interesting and helpful to have tabulated statistics from four or five men of good standing in all the larger cities of this country and Europe. This,

with the recommendation of the commission, would form a good basis for a lecture to the members of every senior class in our colleges. The publication of such a report in pamphlet form, including the code and such other recommendations as are seen fit, might be done at the expense of this Association.

It must be a source of much regret that the measure so ardently and ably urged by your committee for the appointment of dentists in the army and navy failed of passage. We suggest that the present committee of three, who are familiar with the work by their associates in the various States, be empowered to retain as members those who did good service, and substitute active and energetic helpers in the place of those who did not assist. Let the fight be continued; with determined effort it must succeed.

Under the provisions of the measure there were to be appointed three examiners of superior rank. Many applicants with weighty indorsements appeared willing to accept these positions. As the President of this Association I indorsed the applications prepared by the friends of Dr. Wms. Donnally, of Washington, Dr. Jno. S. Marshall, of Chicago, and Dr. V. E. Turner, of Raleigh, N. C. In an informal and friendly conversation with Surgeon-General Sternberg, he said that he would prefer the men whom he appointed to be indorsed or recommended by this Association. This is a gratuitous, though very sensible, expression of confidence in this body, and it might be appropriate to decide through what department such recommendation should be given; whether through the President, Executive Committee, or Executive Council, and, if the latter, whether by individual or collective action.

We urge the continuance of this Committee on the Army and Navy Dental Legislation, and believe that its successful prosecution of the task assigned before the next Congress will serve as an additional argument for the training of commissions whose experience will be profitable to succeeding effort.

The continuous labor of the Committee on History must appeal to the consideration of this body. We suggest that the chairman have power to demand co-operation from the members of this Association. The labor, apparently thankless at this hour, must increase in interest as the years advance. No thought of abandoning the purpose of its original appointment must be considered. We recommend the enlargement of the committee and a vote of encouragement and thanks for the untiring labor performed.

Committee on Museum and Library.—As the years advance there will gradually accumulate responsibilities for this Association, not the least of which will be the continuance and development of an interest in the dental exhibits of the Army Medical Museum. Let us give loyal support to this effort.

The minutes of last year's meeting show that the committee appointed to report on President Burkhart's address advise the appointment of a committee to report ways and means of establishing a scientific bureau. No mention is made of such report. We suggest that the matter be referred to the section officers with power to act.

Committee on Unification of Dental Laws.—We fail to find any response to the recommendation of the Committee on President's Address that one from each State compose a committee to further this object. Let them get to work.

Those of us who are familiar with these annual gatherings remember with pleasure the genial countenance and cheerful manner of one who for years served his profession unfailingly, and whom his associates delighted to honor with the position of Recording Secretary of this Association. Ripe in experience, rich in professional attainments, at peace with the world, in love and harmony with his profession, Dr. Cushing has rested from his labors. We honor his memory, we deplore his loss. We lovingly and tenderly record that he was "faithful unto death."

Finally, friends, I invite you to the consideration of the program prepared for this meeting by the Section officers. Yielding willingly to the expressed wish of these officers, I have taken no part in the preparation of this feast. I am of the opinion that if we accomplish substantial progress it must be through the organized and united effort of the many, rather than through the exertions of the presiding officer. Let us cheerfully co-operate in this plan. Let us freely and fully discuss the papers, assist in the discharge and adjustment of business, and, above all, improve the opportunity for social intercourse, the ripening of friendships, and the extension of acquaintance.

DISCUSSION.

DR. B. HOLLY SMITH: When the organization of this Association was first suggested to my mind, the chief hope was that we might

make definite, deliberate, gradual progress each year. Year by year we meet in annual session. No officer of this Association who carries in his mind the idea of the work that we have gone over this year solicits or arranges a program for the succeeding year. He simply asks some man to write a paper on what subject he pleases, possibly on some subject that is connected with the Section work; that is, the division of the work of which he is chairman. Now, he may write a paper and read it before that Section. He may not have read a paper that was written and read three years ago on the same subject. He may leave the subject absolutely where it was left three years ago. In doing so he has committed an unpardonable offense, but of course one for which he is excused. He has taken up the time of this body or of a Section of this body to go over a thing which possibly a majority of them have gone over carefully three years ago, and upon which they have made up their minds as to the progress on that point. He has not advanced the matter one step. I suggested that commissions be appointed which should have outlined for them a definite field of work, and that these commissions, having made an elaborate report of correspondence and investigation through the Section, should have, in addition to that, a succinct chart of this work which should be presented to the general body; that this chart should represent to us a peg as to how far we have gone this year. No man, if appointed on that same commission, would come in next year with a reiteration either of the facts or arguments used in the preparation of the previous report. No man in the local society in Texas or California would dare to get up and read his amateurish consideration of this subject, but would have to refer to the report of this commission from this our National Association. I say by doing this we can make, and will make, deliberate progress.

I outlined one feature, seemingly insignificant, and yet possibly the most important feature for investigation, and that was the prosecution by correspondence and solicitation of the establishment in polytechnic institutions of a course of studies proper to be pursued in the preliminary education of those who desire to become dental students. Let the work be outlined and formulated, so that a gentleman who represents our profession and our views may be invited to go before a body of educators and say, "I represent the National Dental Association, and I come to read an address on the

preliminary training of the youth who desire preparation for the study of dentistry." Do you mean to say that this would be an undignified procedure? Do you not think we would be discharging our obligations, not only to our profession, but to humanity? I give you my word of honor that the boys of this country, and of all countries, have never been properly educated. Are we asleep? Is not this a crime? If this Association could establish in one institution, like the Boston Institute of Technology, such a proper preliminary course, you could not tell how far its influence would sweep on. It would be like a stream of water. There might be established through our personal solicitation a course of study in that institution—the Boston Institute of Technology—which would be an ideal course, according to our trained conception of such a course. It would be the ideal course for the preliminary study of the dental student. Taking that as a model, it could be carried to New York, Baltimore, Philadelphia, and all through this country. You would not only raise the standard of the men who come into our profession, but you would raise the standard of training of the human family. If I have not made myself clear, I shall be glad to answer any questions in reference to the matter.

DR. CROUSE: I was delighted when Dr. Smith elaborated that matter in his address, because it is the weak point of this Association. Unless this body can adopt some better system, or enter into some plan to obtain better reports and better papers, we might as well abandon the idea of taking up that line and confine ourselves simply to executive work. We are now hardly up to the average of the best State societies, as they do better work than this organization does. For a number of years I have sent to all State societies a communication, urging them to send to this Association men with papers that would be an honor to their society and would help our cause. In very few instances would anything like a satisfactory reply be given. The secretary of each would write a long letter stating who was elected president and how well he presided, and who was elected on the executive committee, and who read papers, but the information that should come to this Association was not accorded. This is not the first time that I have pleaded on this subject before this body or before the American Association, for I have looked upon it as the weak spot. We can come here, lay pipes, elect officers, and get up resolutions, but we are not achieving scientific

work and bringing it here. Now, that is why I pleaded before the Southern Association not to recommend going away off somewhere for the next meeting, but to hold it in a center where we could get a larger body of men together. We should have a thousand permanent members and five thousand dollars a year coming in, enough to pay men to do original work. We ought to have the ideas of such men, and the Association should be paying for the work.

DR. CRAWFORD: I am very much interested in the President's address. I was very much pleased with it, but I am more interested in the question to which Dr. Crouse spoke than in anything else. I have never in my life asked an association to which I belonged to do anything that I did not know to be right, and in most instances I have seen them come around sooner or later and do the proper thing when I have asked them to do something definite. Dr. Crouse says we ought to have a thousand members. That is putting it very low. If this Association will resolve unanimously to do what I will ask it to do, out of the twenty thousand dentists we have in the United States, instead of having one thousand members, we can have two or three thousand, and that will be something respectable.

About this Section work: there ought to be four large, well-organized, well-conducted, practical Sections. Now, this year operative dentistry has made a rather respectable showing. Prosthetic dentistry has done something; not very much. We ought to have a well-organized Section of operative dentistry, a well-organized Section of mechanical dentistry, and then a Section on clinics, and, fourthly, all the fundamental and scientific branches to be put in one Section. New Sections should be the outgrowth of the future. Then we would not have men coming up here with more papers than we could handle. As it is now, when a man comes up here who lives off in the mountains somewhere or in some remote part of the country, he brings a paper which he thinks is new, and he wants it read before the whole body. If we had these matters submitted to these four Sections, and if it was thoroughly understood that nothing should be read before the general body unless it was a paper of sufficient merit to interest the entire body, then there would be no such difficulty. Otherwise, let the paper be read and passed upon by the Section, and let that be the end of it. I do not like to think that we have six or seven Sections in the National

Association and yet that we do not have one Section meeting and doing practical work. If we had something of that kind, and it was understood that we were actuated and controlled first by the desire to advance the interests ot the dental profession rather than any personal or local interest, and if we held our meetings in the great centers of the country instead of away off at the edge of the country, if we had Sections that would utilize the bone and sinew of the profession, and that would have the support of the twenty thousand dentists of the country, then we could have a body that would do something; and instead of getting in five thousand dollars a year, as suggested, you could put ten thousand dollars a year in the treasury, until finally we would have a fund something like the American Medical Association, which has a fund of sixty thousand dollars. The silent, constant impact of a moral force is not appreciated by mankind, but the fact that we had twenty thousand dollars in our treasury would make us respectable. Money does talk, and under those circumstances the influence of the Association would be more felt. Let us stop being a sort of secluded society, meeting at summer resorts where we have it hot enough to melt us. I would be willing to go anywhere if we could accomplish the result which I have suggested. Let us adopt the suggestion of the President. Let us encourage some technological institution that will carry out some of our ideas. What have we done in the past? We get together and brag about being the greatest profession in the world. Let us get up and stop bragging and do something. Dental caries is ravaging this country. That is attributable largely to our lethargy. We get out an annual program and have a great hullabaloo, and we have a lot of little fellows showing medicines and showing this, that, and the other thing, and we go home without doing anything. Let us get up and do something. Do not let us go on meeting at summer resorts, putting on our pigeon-tailed coats, flying around and having a good time. Let us get up and do something. Then people will stop calling us "tooth carpenters." They will pay some attention to what we say. We ask the Congress of the United States to appoint in the army and navy men to take care of the teeth of the soldiers and sailors, but they ignore us, yet every member will allow the use of his picture and his name to advertise Pe-ru-na. God have mercy on a politician that has no better conception of ethics than that! I never hear of a

minister of the Gospel who lends his name to the advertisement of a patent medicine preacn, and I will not vote for a man for any office who will do the same thing. I do not care whether any one indorses that sentiment or not. We should act in a solid phalanx, and when a man sees the right thing he should indorse it, whether it comes from the East, West, North, or South. Let us stand up for what is right.

DR. MCMANUS: Our good President did me the honor yesterday to appoint me on a committee to consider his address. I am very strongly of the opinion that hereafter the President's address should be printed in advance, and distributed to the members of the Association. It is, I think, absolutely impossible for the members to take in all the good points of such an address as we had from our President here, and for that reason it is very difficult for many to take part in the discussion of it. I, in connection with the other members of the committee, had an opportunity to read the address carefully, and it is full of good suggestions. The report of the committee merely alludes to a few of them. The President's remarks on preliminary education are very sound, and up to date in every direction. I have listened with a good deal of interest to Dr. Crouse and to our friend Dr. Crawford, who has just closed his remarks, and they have talked about a thousand members of the National Association. What has been the record of this Association in years past? I have been a member of the old Association and of this, dating back thirty-five or thirty-six years, and I know something about the membership of the Association. I know year after year a great many come to the meetings of this Association, and sit here and enjoy the discussions and have a good time, who never bring any credentials and never pay any five dollars for membership. After the greatest efforts that have been made to bring in members, I think at no time have we reached five hundred paying members. I doubt if the records of the Treasurer will show two hundred paying members of this Association to-day. Much to my surprise, I found out that after our grand meeting at Niagara last year, which I think was one of the finest meetings this Association ever held, there were not three hundred paying members. We have not averaged two hundred paying members for years past. Does this show a proper interest on the part of the members of our profession, that out of the twenty thousand there are not five hundred

men in this country who are willing to pay five dollars each toward this Association to enable it to do advanced and scientific work?

Having had the privilege of looking over the President's address, I was particularly struck with the remarks which I will read to you. He says:

"It is of vital importance to the purposes of this Association to establish and strengthen an influential, if not an authoritative, relation between this and other dental organizations. The National Association of Dental Faculties, the National Association of Dental Examiners, and State and local societies should all hold allegiance to this body, even though this allegiance would cause some slight sacrifice."

In looking over the Transactions for years past, it has struck me very forcibly that in the matter of dental faculties we have had but a very small representation in the membership of this Association. We have, it is said, forty-eight colleges in this country in good standing, or at least members of the Dental Faculties Association. Allowing an average to those colleges, in the teaching faculty, professors and lecturers, of ten each, we have four hundred and eighty members of the dental profession teaching the youth in this country, and yet this Association has not two hundred members; and the college men, who ought to be in touch with the profession at large, who ought to be known as members of this Association, and if they were so known it would attract many of their former graduates to become members,—we find that they are not here. We find, in looking around, that we have in our membership the representatives of a few of the oldest colleges which have been in existence for over forty years. We find that they are still taking the working oar. The recently established colleges have not been and are not as well represented in this Association as they ought to be.

We have in this country at present forty-five good States, and they are supposed each to have five dental examiners. That would represent two hundred and twenty-five dental examiners, who should be in touch with the profession all through the country. I object to that association being called a National Association of Dental Examiners, for I do not think they represent the nation. I think there are many States that are not represented in that association. But whether they are represented or not, these men as dental examiners should take an interest in this Association, for this Asso-

ciation, and all other associations,—although I think this is the foremost of associations,—are all post-graduate dental schools, and the dental examiners should be members of this Association. There are seven hundred and five men connected with the educational institutions and the boards of examiners, and yet this National Association, so called, has less than two hundred paying members. Now, it is well enough to talk about a thousand members. I should love to see five hundred members of this Association. Then we have many State societies, and the President suggested that they should be in touch with us. Now, if we go home hereafter as we should, we should try to induce members of our State societies to become members of this Association. If the professors in the dental schools would say to the members of their graduating classes, "Join your State society and become delegates to the National Association," I have no doubt they could exert a great influence in that direction. Only a few days ago I heard of a prominent member of a State society endeavoring to dissuade some of the younger men who wanted to come here as delegates to this meeting. He said, "Oh, I would not join that Association. Stay at home and go to your State society." It seems to me every State society should make a strong effort to send delegates, and that the dental faculties should talk to their graduating classes and tell them to become members, and that the Board of Examiners, who ought to be in touch with the profession of their States, should urge their members to become members of this Association. To me it has been pitiful in one sense to look back year after year and see members of the dental colleges, members of the faculties, at the different meetings and none of them with credentials to this Association. In the same way I know many members of the Dental Examining Boards who are not members of this Association.

We should really commence to educate our students after they have left college. I do not care so very much about "preliminary education"; that matter will settle itself. But after students have graduated, then is the time to urge them to join our societies and make them take an active interest in the work for the benefit of the profession.

DR. M. F. FINLEY: I should like to say, as an earnest of what one society is trying to do in the line suggested by the President, and also referred to by Dr. McManus, that our little society in Wash-

ington, D. C., has about forty per cent. of its membership among the permanent members of this body. So it is with their Board of Dental Examiners. They are all members, and now in attendance. We like to come here and get all the information we can. Probably we do not do as much in the line of scientific work as societies that are represented by greater numbers. Still, we take that amount of interest in it.

DR. CROUSE: It comes to this at last: When you persuade a young man to attend this meeting, and after coming he does not get anything, he says, "Why, I could have a better time at our State society, and learn twice as much in a day as I do in four days here, at less expense." He is right, and we must perfect our Section work and get something that will please those who come here. Therefore every member should be in his place to help organize the Sections. Very many times they have been organized after we assembled, and often the chairman of the Section, or the chairman and secretary, were the only representatives of it. We want a chairman and secretary in every Section who will work hard all the year in getting up its report, for it cannot be done after you come here. Nevertheless, many times I have known the entire report to be made up after the Association convened. When we organized the Section plan it was seriously considered that it would allow different Sections to report each year, and the rest could be getting their reports ready for the other years; but that plan does not seem to work well, perhaps because the interest lags through delay. At any rate, there is no use talking about increasing membership unless when you get a young man here you give him something of benefit. If you do not he will say, "I do not get enough to pay me for coming."

DR. BOGUE: Our friend Dr. Finley alluded to the report of the President, and so did Dr. McManus, in a line that I have thought about for the last two years or more, but they have not touched the point yet. Dr. Crouse may talk very well about the young graduates that he wants to get into this Association, but the American Academy of Dental Science at Boston was told, "You cannot be represented in the National Association." The Odontological Society was told, "You cannot be represented there." The same thing with the Institute of Stomatology in New York, and the Academy of Stomatology of Philadelphia.

DR. CROUSE: Has not that rule been rescinded?

DR. BOGUE: We have not heard of it yet. The motion was made last year to rescind it, but that motion, so far as I know, has not been acted upon yet. I want most heartily to uphold the suggestion of Dr. Burkhart last year and of the President this year and of Dr. Crouse, but it needs the action which I have suggested. I hope these various societies, which are doing good work, may be allowed to send representatives to this body.

DR. HINMAN: As Chairman of the Clinic Committee, I feel that I must make a defense of the work of that committee. We have not had a chance to be heard yet. The clinics are to be held this afternoon, and I believe if the young men will pay close attention to those clinics they will be fully repaid in a practical way for their attendance at this meeting. Last year, as is well known, the clinics were not a feature, and it was decided to make clinical work a feature of the meeting this year. I believe when the report of the clinic committee comes in you will find that any one who comes here and observes the clinics will get practical benefits which will well repay him for his trip.

DR. DARBY: There was one recommendation in connection with the President's address which has not been touched upon, and I presume my views upon it will be at variance with those of the majority of the gentlemen present. I allude to the recommendation of renewed effort to have appointed dentists in the army and navy. If I remember right, between three and four hundred dollars were voted yesterday for the expenses of the committee who have been working, no doubt faithfully and laboriously, to have a bill passed through Congress providing for the appointment of dentists in the army and navy. Desirable as it may be, and it is unquestionably important, it seems to me that the dental profession is humiliating itself in knocking at the door of Congress for the appointment of men as useful as it is known dentists would be in the army and navy. I have never yet asked for any position which could be given to me by the people. I will never knowingly seek any position where I am not wanted, and where I do not feel that I am accorded a hearty welcome. It seems to me that the dental profession in asking the Congress of the United States to introduce into the army and navy men whose usefulness is so apparent is humiliating itself by that very act. We are asking the government to put into

those positions men who are competent to pass rigid examinations and show marked ability, and serve for salaries not greater than many artisans receive in this country. I am opposed to every effort in this direction. If it is not apparent to Congress after the letter that Surgeon-General Sternberg received from General Otis, telling him that the teeth of our soldiers in the Philippines are going to destruction for the want of the care of dental surgeons, if that is not sufficient appeal to Congress, what more can we say and what argument will avail? I say we are doing a humiliating thing in begging the government to receive us.

DR. BOGUE: I want very respectfully and kindly to differ with Dr. Darby clear down to the bottom. It is the best men in this profession who are asking that these positions be established in the army and navy. Not for themselves; they do not want the positions. They are asking for the creation of these positions because the men in the army and navy are suffering, and our Congressmen are not the intelligent men that Dr. Darby gives them credit for being. They do not know what dentistry is, and, not only that, the medical men do not know. In proof of that I can refer to our chairman (Dr. Brophy) for a moment. He can tell thoroughly well how many years it has taken the better class of medical men in Chicago to recognize the importance of the special work done by dental surgeons. Let us keep on doing the work that we are doing in the way of caring for the army and navy. The better men of our profession are asking it for those not able to ask for themselves.

DR. FINLEY: As Chairman of the committee who have been working for the past year to secure the passage of the bill referred to by Dr. Darby, I wish to say that I think he is a little in error when he says that Congress is not in favor of it. The military committees of the Senate and of the House reported the bill favorably. The Senate passed the bill, and the House is only waiting for a chance to vote upon it. A large majority of the members of the House are in favor of the bill. It is in a good position to be brought before the House at the coming session of Congress, and I believe without any question that it will then pass. The Surgeon-General is in favor of it, and the surgeons in the army who have been to Manila are most decidedly in favor of it. It lacks only a chance to come to a vote. The status, salary, etc., are the same as for contract surgeons. The salary is eighteen hundred dollars per annum.

SECTION III.

Operative Dentistry, Materia Medica, and Therapeutics.

Inlays, Their Advantages and Limitations.

PAPER BY C. N. JOHNSON, OF THE SECTION.

THE demand for inlay fillings arises chiefly from two factors which present themselves in the problem of saving the natural teeth when badly affected by caries. The first of these relates to the unsightliness of most metal fillings when exposed to view in the anterior part of the mouth, and the second to the fact that in many instances of extended caries the insertion of foil fillings proves too great a tax on the patient.

The indiscriminate exposure of gold in incisors and cuspids has justly given to American dentistry a certain reputation for vulgar display which cannot longer be ignored. If we as a profession are to rise to the highest possibilities of our art we must exercise a due regard for the esthetic effects of our work, as well as for its utilitarianism. It has truly been said that the most perfect conception of art is to conceal art, and in no department of human endeavor is this more strikingly true than in the practice of dentistry.

Unfortunately for us and for our patients, we are not yet able with our present facilities to uniformly combine esthetic effects with utility, for, much as the herald of trumpets has sounded forth throughout the land, the dental millennium is not yet upon us.

There are certain cases where, by the judicious use of inlay work, ideal results may be attained, but there are a vast number of others where the conditions are such that inlays cannot by any possible

means be made artistic and permanent. In alluding to the artistic features of inlay work reference is of course made to porcelain inlays, and it is doubtless true that a properly constructed porcelain inlay is more artistic in appearance than any other kind of filling-material. But when this is said, almost all is said that may be in recommendation of this kind of work. The simple fact is that in the very cases where the greatest need is manifest to avoid conspicuous operations porcelain fails in other important requisites to a degree which renders its use almost prohibitory.

For instance, in a long, thin, translucent central or lateral incisor with an approximal cavity which involves the incisal angle we have a type of case which calls not only for harmony of color, but for some material which possesses great strength in a given bulk. It is here, if in any place, that appearance is important, and in no less a degree is it necessary to reproduce the lost angle with a substance which is capable of withstanding attrition and not suffer displacement or fracture. Porcelain, when carried out into thin edges, such as are sometimes called for in these cases, has not the requisite strength or toughness to do extended service in the majority of mouths. It will not do to point to a few isolated instances where porcelain has proved satisfactory in such cases, and argue therefrom that it is always to be depended upon. In some mouths the volume of usage on a given tooth is very small, and any kind of a filling-material will do service, but these are the exceptions.

It must be acknowledged that a perfectly condensed gold filling is infinitely tougher and less friable than porcelain, yet even the best inserted gold fillings are sometimes inadequate to the strain. Then the question of anchorage is often an important factor in these fillings. With the incisal angle gone and the necessity existing for its reproduction, a certain area of the inlay is exposed directly to the force of attrition, and the anchorage afforded by the cement cannot be considered sufficient to maintain the inlay in place for any extended use. It has been found that in the insertion of gold in these cavities, with all the nicety of adaptation possible, and with the greatest density and strength, failures have too frequently occurred through displacement of the filling from the incisal anchorage, so that observant operators are quite generally resorting to the plan of anchoring these fillings by drilling across the

incisal portion of the tooth and making an anchorage at right angles with the approximal cavity. This seems the only certain method of locking these fillings securely in place, and it is a method which cannot in ordinary cases be successfully followed with porcelain. Even in those instances where a perfect alignment and perfect form can be given the inlay, the lack of strength at the point where the approximal portion joins the incisal portion is always an element of weakness. The filling-material must be especially tough at this point to prevent breakage, and, as has already been intimated, porcelain is too friable to be subjected to this kind of stress.

Another important factor in these cases is the protection of thin enamel. With gold—or better yet, with platinum and gold—a wall of enamel may be adequately protected by building the filling over it to the thickness of one-half a millimeter, while porcelain, to afford any protection whatever, must be laid on in appreciable bulk. At best, porcelain must be considered a poor protection to thin enamel-walls, even where it can be successfully built over them.

It will thus be seen that in many of these very conspicuous cases the indications are almost wholly against porcelain inlay work, so far at least as permanence of result is concerned, and in passing it may be well to call attention once more to the possibilities of platinum and gold in this particular class of cases. The shade may be so varied with this material as to take away the extreme yellow luster of gold and produce fillings which are never glaringly conspicuous, and which are immeasurably more reliable and secure than the best possible porcelain inlay. A closer study of this material on the part of the profession will accomplish much in the way of disarming the persistent criticism against display in American dentistry, a fact frequently pointed out by our good friend, Dr. H. J. McKellops.

And yet, as has been stated, there is no metal filling which can quite take the place of porcelain in appearance, and it should be our aim to study the possibilities of porcelain and adapt it to those cases where the indications are favorable to its use.

Such cases are represented by all cavities which are not exposed to attrition, but which are freely exposed to view. Those with a broad opening to the labial—particularly those occurring in the gingival third of the labial surface—may be accounted typical cavities for porcelain inlays. It is here that artistic and serviceable

work may be accomplished, provided the operator attains a mastery of shades. This question of shading becomes a matter of very great importance in its relation to artistic results, and this, if there were no other reason, should determine the selection of bodies for such work which fuse at a temperature sufficiently high to assure permanence of color. The bodies which are capable of being fused on gold cannot be relied on to permanently maintain their color in the mouth, nor are they so strong in a given bulk as the higher-fusing bodies. If porcelain inlays are indicated at all, the very best and strongest and densest porcelain is none too good for the purpose. The present clamor for short-cut methods in this kind of work is calculated to lead to such imperfections as will eventually bring the work into disrepute, and throw doubt on an otherwise legitimate line of practice.

The indications for inlay work, aside from esthetic considerations,—viz, the undue tax on the patient in the insertion of large foil fillings,—apply particularly to molars and bicuspids. It is here that inlays really may be made to answer the most useful service. In cases where an appreciable portion of the crown is gone inlays of gold may often be inserted to good advantage, and thus save the patient the tedium of a protracted filling-operation. These inlays of gold may be used in very many cases where operators have been in the habit of crowning teeth. It is often a nice point to decide where fillings shall stop and crown-work begin, but if the operator has a true conception of the possibilities of gold inlays he may frequently save himself any doubt in the matter by employing this ready method of closing the gap between filling and crowning. A tooth with any appreciable portion of the crown missing has in later years quite generally been consigned to excision of the remaining portion for the purpose of inserting an artificial crown, quite irrespective of the condition of the part still standing. This is hardly living up to the highest possibilities of dentistry, because the history of crowns in the years to come will go to prove that the best interests of the patient will be conserved by deferring crown-work as long as possible. The serviceability of many a tooth may be prolonged for years by the judicious employment of inlays in those cases where there has been so great a loss of tooth-tissue as to make the insertion of a filling injudicious. The tenure of service of the inlay may be logically added to the ultimate life of the tooth,

from the fact that when the inlay fails the tooth may then be crowned with as great a promise of future usefulness as if it had been crowned at the outset. In pursuance of our work upon the natural teeth we should have in mind not only the comfort of the patient at the moment, but the greatest ultimate length of service that we can secure for the organs operated on.

One very favorable feature of gold inlay work relates to the adequate protection it affords to weak walls surrounding the cavity. It is in this respect that gold inlays are vastly superior to porcelain inlays. In preparing cavities for gold inlays the frail enamel may be freely ground and extensively beveled with the assurance that the edges of the inlay when built over them will prove an all-sufficient protection against wear or fracture from impact of mastication. In fact, this is one of the cardinal requirements in preparing these cavities, that the margins of the cavity, particularly those in the occlusal region, be very freely beveled so as to admit of a perceptible overlap of the inlay. A degree of bevel may safely be given the enamel for these inlays which, if employed for foil fillings, would prove an element of weakness to the margins.

Another feature connected with these extensive bevels would seem worth mentioning,—viz, the fact that the cementing substance used for holding the inlay in place appears to be in a measure protected by the overlying margin of the inlay. If these cases are carefully examined some time after their insertion it will ordinarily be found that the cement is dissolved out for a short distance under the extreme margin of the inlay, but that the dissolving out seems to stop at this point and not penetrate far enough to jeopardize the inlay. This has been noted so frequently that it has proved a matter of considerable encouragement, so far as the permanence of cement is concerned under gold inlays with extensive bevels.

It was formerly the impression of the essayist that the cementing material was invariably an element of weakness in the use of inlays, but a more extended observation would seem to indicate that we have little to fear from this, particularly with these gold inlays and a high-grade quality of cement. It is with inlays, as with every other line of our work, that the real test, after all, is the test of extended practical experience, and no amount of preconceived opinion can have weight against this kind of evidence. So many of these gold inlays have been examined after years of service, nearly

all of them presenting this peculiarity, that it would seem impossible to doubt that where due care has been exercised in the adaptation of the inlay and a good grade of cement used little fear need be had as to any serious washing out of the cement.

But as to the relative merits of fillings and inlays in general, it may be stated that in the vast majority of cavities presented for our treatment fillings are infinitely more serviceable than inlays. The requisites for inlay work are in many respects so arbitrary as to prevent the possibility of its being at all universally applicable. A cavity must be cut in such a way that the orifice is more widely extended than the interior, and in many instances this involves the breaking down of strong walls which with ordinary filling-operations might be allowed to remain. For instance, in an approximo-occlusal cavity in a bicuspid where the decay has extended well around to the buccal and lingual surface at the gum-margin, but where the walls of the cavity are strong and well supported near the occlusal region, it would be a very radical procedure to cut away the buccal and lingual walls parallel with the decay in the gingival region, as would be necessary to properly fit an inlay. It would not only be a tax on the patient, but would materially weaken the tooth. This is only one of the many cases where a perfectly fitted inlay would involve too serious a sacrifice of strong walls, and this may be said to apply as well to incisors as to bicuspids and molars.

There are numerous cavities which may be made to receive a foil filling without any exposure to view, but which if sufficiently opened out to receive an inlay would thereby be rendered conspicuous. In fact, in the majority of cavities which apply to us for treatment the insertion of an inlay involves the extension of the cavity outlines to a degree unnecessary in an ordinary filling; and while this extension is often a safeguard against a recurrence of decay in bringing the line between inlay and enamel to a point where it is readily kept clean, it sometimes leads to unnecessary exposure of the operation. No method of reproducing lost enamel can ever quite equal in appearance the natural tooth-structure, and the less conspicuous our operations are made the nearer we are likely to approach artistic perfection in our work.

One other factor in connection with inlay work relates to the greater expenditure of time necessary where inlays are used than

when ordinary fillings are inserted. It is true that the element of time is a minor matter when considering the accomplishment of the highest class of service to our patients, and yet in the daily routine of office practice time becomes important. With a cavity of average size it is conservative to state that a gold filling may be inserted in one-half the time required for an inlay, and the resultant operation will at least prove equally permanent, so that this feature of the case cannot well be ignored.

It may therefore be said in conclusion that the legitimate use of inlays is quite narrowly restricted to those exposed surfaces where artistic effects are very important, and to the cases where the tooth-tissue is so extensively broken down as to make the insertion of a foil filling too great a tax on the patient. To employ inlays outside of these indications is either to misconstrue their true function, or to let enthusiasm overbalance judgment.

DISCUSSION.

DR. W. V-B. AMES: The propriety of my selection for the opening of the discussion of this paper seems to me doubtful, as I feel that the paper has been written at this time because of the very general interest in the porcelain inlay. My only excuse for attempting the opening of this discussion is that I have had a quite extensive and varied experience with the gold inlay, almost identical in its construction, but differing in inherent possibilities. Please recognize this similarity of construction. My opinion of the limitation of scope of the porcelain was formed long before the present craze for it was inaugurated, and coincides so closely with what has been given by Dr. Johnson that I will have very little to say on that special subject. There are no doubt many men ready to take up the championship of the porcelain inlay as soon as I yield the floor. I wish to say that I am hoping, as I have no doubt Dr. Johnson is, that our estimate of porcelain as an inlay material has been too low. Dr. Johnson says, "It is with inlays, as with every other line of our work, that the real test, after all, is the test of extended practical experience, and no amount of preconceived opinion can have weight against this kind of evidence." I trust that the strength and adaptability of porcelain may be found adequate in a larger number of cases than some have been inclined to suppose.

As to the comparative strength of high- and low-fusing porcelain, it has been demonstrated that low-fusing porcelain has surprising strength when fused under favorable conditions. For example, a button made at one fusion. It has been my experience that the same porcelain or semi-glass will not have that same texture if fused in successive layers, the initial layer being seriously damaged by successive heatings. This does not come to pass in the usual process of building an inlay with materials requiring a higher heat for fusion. As to the possibility of getting translucency and satisfactory tinting, I believe the real porcelain to be immeasurably superior to the semi-glass. Experience shows that the cement feature has been underestimated. As a result of experience with inlays, the teaching in regard to the reliability of oxyphosphates at the cervical margins must be modified. In conversation, in society papers and discussions, and in text-books we have gotten the statement that oxyphosphates cannot be relied upon at the cervical margin of a deep cavity, and that gutta-percha must be used there for safety. Success with inlays has demonstrated that we must look for some other explanation of such failure of oxyphosphates than the effect of environment, since this is the portion of the periphery of an inlay about which we need to have least concern after proper preparation of cavity. This is unmistakably so simply because of this part of the periphery being removed from the wash of mastication, etc. I cannot refrain from touching upon the difference between washing and solution of cement. The essayist possibly unintentionally refers to this in one sentence as solution, and in another as washing. A really reliable cement I have for a long time claimed does not dissolve, but simply washes, and that seems to be demonstrated with inlays. The cement remains intact at the cervical margin, and washes at the masticating surface in proportion to its subjection to attrition of liquids and solids. If there were a solution there would be no cessation of the waste just below the margin of inlay and enamel, such as is spoken of by the essayist. (It might be said that the cement *is* dissolved to an extent when it is damaged to a slight depth by being subjected to moisture before setting sufficiently, as in this condition some of the acid is drawn to a greater or lesser depth and the cement rendered less able to withstand attrition to that extent.) As an enthusiast on the subject of gold inlays, I can begin to differ slightly with the essayist,

though at the same time I am very much gratified to hear from such an authority an opinion, founded on observation, so favorable to the practicability of this method. It seems that the gold inlay is in a fair way to have its inning, notwithstanding a remark during the session of Section III this afternoon that they should be relegated to the waste-basket. I regret the absence this evening of Dr. C. L. Alexander, of Charlotte, N. C., who obtains such beautiful and practical results with what he terms cast fillings. His descriptions of the process published in issues of the *Dental Cosmos* are probably familiar to many of you.

I began in 1889 to make use of the gold inlay for the repair of bicuspids and molars with which there had been serious loss of tissue, and with which the *dernier ressort* of crowning was not called for. From a conservative use of the process I soon became an enthusiast, and the test of time has seemed to warrant it. It has been to me an extremely satisfactory intermediary operation between the small, easily-made gold filling and the badly broken crown unmistakably needing excision. I more and more desire to avoid the offset of the band beneath the gingiva. The gold inlay can be constructed and cemented without the application of the dam, which recommends it especially in the multitude of cavities extending far beneath the gum line.

The feasibility of protecting frail walls, at the same time protecting the cement joint by beveling freely and carrying the gold over the bevel, is, it might be said, the vital principle of the process. Ability to burnish up to the last addition and then burnish the edge of the finished inlay is worthy of consideration. The impracticability of extending porcelain in thin edges is many times against its use. This limitation is not so much because of the occlusion coming directly upon these thin extensions, as they are generally removed from the point of real contact, but because the frailty of such an edge precludes the use of cement of such consistence as should be used, and as can be used with the gold inlay or one of porcelain having no attenuated edges.

My confidence in this operation and the integrity of a proper cement properly used is such that I have been rapidly losing any cunning I may have ever possessed in the working of foil and the crystalline forms of gold, so I of course recognize the fact that I strain a point occasionally in deciding upon an inlay, just as Dr.

Johnson, for instance, would be inclined to the packing of foil in cases in which I would irrevocably insist that an inlay would best answer all needs.

DR. DARBY: I rise not to criticize the paper, but rather to indorse it. Dr. Johnson's paper was so thoroughly good in every particular that I think even the most extravagant admirer of porcelain inlays could hardly gainsay anything that he said. He says porcelain inlays have their limitations, and every one here will agree with him, but I think some enthusiasts for porcelain inlays would say that they have no limitations. I think if you were to put that question to Dr. Jenkins, of Dresden, to his associates in practice, or to Dr. Head, of Philadelphia, they would say that porcelain inlays have next to no limitations, and I say that because I know that these gentlemen employ porcelain inlays in almost every instance where a filling of any kind could be inserted. I make that statement guardedly. I say they use them almost anywhere where any filling could be inserted.

It requires an immense amount of practice and great skill to employ porcelain in the way in which they employ it, and I have seen instances in the practice of Dr. Jenkins where I was puzzled to know how he succeeded in putting inlays in the positions in which he did. In my own practice porcelain inlays have their limitations, and Dr. Johnson has not exceeded those limitations in his paper.

There are many places where I employ porcelain. For instance, I employ inlays in the cases that Dr. Johnson has mentioned, one-third of the labial surface nearest the gingival margin. I think that is one of the most suitable places for inlays.

I also agree with what Dr. Johnson has said about the necessity of nice matching of shades and tints. There is nothing that requires greater care or more prolonged experience than matching shades when baking porcelain. And just in proportion as porcelains fuse at a low temperature, just in that proportion it is difficult to match shades. Porcelain when fused at a higher temperature than the porcelain represented in the sample of shade will have some of the coloring-matter burned out of it, and the result will be a shade which does not match what you are trying to match. Just in proportion as porcelains fuse at a high temperature, just in that proportion is it easier to match shades and tints.

As to the employment of porcelain inlays on approximal sur-

faces of the posterior teeth, the bicuspids, and molars, they have not been as useful in my hands, and yet Dr. Jenkins and Dr. Head successfully make use of them on many of these approximal surfaces where they have by previous separation restored the contour of the approximal surfaces, and they have made operations that have been lasting and beautiful. I cannot do it. That is, I cannot carry out my ideals in porcelain as I can carry them out in other materials.

Now, a word in regard to the gold inlays. I remember very well when gold inlays were first suggested. I believe to Dr. Bing, of Paris, belongs the credit of having first introduced gold inlays. In 1876, during the Centennial Exhibition, he came to my office and asked to go into my laboratory, saying, "I will show you something new." He then asked for some scraps of fine gold, which he placed on a piece of charcoal and melted into a globule, and then, laying the gold on the anvil, with a hammer struck it into a thin disk. He asked for a molar tooth which had been extracted, with a large cavity on the occlusal surface. I gave him one. He quickly shaped it with a large bur and corundum point; he then soldered onto the under surface of the disk of gold a little loop of gold or platinum wire, and roughly burnished the edges of the disk to the margins of the cavity. He then asked for gutta-percha, which was softened by heat and the cavity filled quite full. The disk was then heated and pressed into the gutta-percha, and when cool the excess which had been forced out between the cap and tooth was trimmed away and the surface finished the same as an ordinary gold filling. I do not think he consumed more than ten or fifteen minutes in the operation, and the result was really beautiful, and I know it would have been serviceable, because I have made since then a great many similar operations, both upon the occlusal and approximal surfaces of the teeth. Many of them have been in use for ten, fifteen, or twenty years, possibly since the Centennial year, and are doing good service to-day. That was the first I knew of gold inlays.

I know this method differs from the method suggested by Dr. Johnson and Dr. Ames, but it is a method that will save teeth.

When Dr. Johnson was speaking of the durability or non-durability of the cements, the question arose in my mind, Would not gutta-percha in these cases have served a better purpose?

As I said in the beginning, I did not rise to criticize the paper, but rather to indorse it.

DR. G. V. I. BROWN: Something over ten years ago I was an advocate of inlays. At that time I experimented a good deal with them, making them out of such bodies as we then had, because, of course, the newer low-fusing bodies were not understood as they are at the present time. The inlays were made from pieces of porcelain teeth ground to fit the cavity, of gold adapted to the cavity in various ways, and porcelain baked in a platinum matrix burnished to the form of the cavity. This gives me a record of something over ten years' actual experience, and I can say that a large proportion of those teeth were afterward filled, some of them with alloy and some of them with gold, and, so far as I know, they are in good serviceable condition yet; whereas the inlays in the same cases only preserved the teeth for a comparatively short number of years. A good many of those inlays that I happen to know about at the present time are still doing good service, and are entirely satisfactory; but they are so simply for the reason that they happen to be in the mouths of patients who will have them constantly looked after, who go to a dentist frequently, and when the line of demarkation between the inlay and the tooth becomes too noticeable, and it is evident that the cement is washing away, as Dr. Ames would perhaps have me say, they will have that line attended to. It is possible to prevent an inlay from failing by working a little liquid cement into this interspace, or, better still, a little gutta-percha, by rubbing it down with a warm instrument, and in that way prolonging the usefulness of the inlay almost indefinitely by repeating this treatment when necessary.

The reason why I finally became dissatisfied with inlays was not because they could not be made to last, but because in a large proportion of the cases I got a less sightly appearance. The cosmetic effect was less perfect than I think it would have been with any other material which would have made a definite contrast and have shown once for all that it was a filling of some kind, not a patch or imitation.

Perhaps the best inlays I ever succeeded in making were those with which I was not so particular to have a perfect line between the enamel and the porcelain, but with a very fine instrument made a line of gold around the labial border and, on such surfaces as were inaccessible on the lingual side, lined the inlay with amalgam. Such inlays as that are there now, and I expect will continue to be

useful for many more years. Wherever an inlay can be placed in a tooth the pulp of which has been destroyed, and it is possible to get a pin to go into that root, use gutta-percha always and forever, and I am satisfied you will never regret it.

DR. OTTOLENGUI: When Dr. Ames was on the floor he alluded to the fact that in the discussion before Section III this afternoon it was suggested that gold inlays should be placed in the waste-basket. I beg to confess that I was the delinquent. The question was asked me at the time by Dr. Johnson, when the placing inlays in one Section or another was being discussed. Dr. Johnson asked, "If inlays of porcelain should be considered in Section I, where would you put inlays of gold?" and I said, "In the waste-basket." I did not at the time know that Dr. Johnson was to read a paper on the subject, and before Dr. Ames mentioned the matter here this evening I had quietly come down the aisle and apologized to Dr. Johnson and been acquitted of any seeming discourtesy. But, after all my apologies, I must say that on the whole I still think the waste-basket to be a very good place for gold inlays, and I believe that a good many of them will get there. When I spoke in that manner I was not really considering the actual usefulness or unusefulness, if I may use such a word, of gold inlays, but I blurted out the remark in a thoughtless way. Back of it there was in my mind this idea: that the gold inlay has always seemed a sort of short cut for an unskillful man to do what his skillful neighbor does with a gold filling, and it has been my opinion that the final test of the best dentists in our profession in the past and the test which should be continued in the future is the skill and ability with which American dentists make lasting operations with gold foil.

I have in a measure been somewhat responsible for the esthetic craze now passing over the profession, but back of it all there is a consciousness in my mind that there is the possibility that as we become more esthetic we are becoming less practical and less useful to our patients.

I could not but indorse Dr. Johnson's paper because of its very conservatism. He told us that nearly every place in the mouth is a bad place for an inlay, and that in the places where you could put an inlay it would be better if you would put a gold filling there. Well, I am perfectly willing to admit that.

I want to say a word about some remarks that were made con-

cerning porcelain inlays. I admit, and I do not mean it as an expression of modesty, but merely the relation of a fact, that I am not skillful in the matter of porcelain inlay work. Nevertheless, it has seemed strange to me to hear the remark made so often, which has been reiterated by Dr. Johnson and Dr. Darby, that the ideal place for an inlay is in the labial gingival locality. To my mind, just in proportion as you get depth to your cavity you will get the possibility of having a durable inlay. Depth is a difficult thing to procure in the gingival labial surface. The most disheartening failures which I have had have been exactly in that locality, and, to my mind, if we consider the matter from the esthetic standpoint, the most useful place, the most practical place, for porcelain inlay work is in moderately small cavities in the approximal surfaces of the six front teeth. As I look at it, the very nicest thing I have done with porcelain for any patient was for a young woman whose teeth were disfigured by little fillings of gold in the approximal surfaces, so that at a little distance her teeth looked just as much decayed as though they had not been filled with these little, perfectly regular, semicircular cuts in the teeth. It is possible that the dentist had brought his cavities too far to the front, but I had to take them as I found them, and the young woman was complaining of the appearance and asking for porcelain. They were small cavities, and I put in small porcelain inlays. I am sure that I could have refilled them with gold in much less than one-half the time, but the result far exceeded anything obtainable in any other part of the mouth, and they seem to be more durable there than anywhere else.

Another thing is, why should we consider porcelain only from the standpoint of esthetics when it has another exceedingly useful property in a place where we constantly say to our patients, "I do not think it would be wise to put a metal filling in this cavity"? I mean in those cavities where the pulp is so nearly approached that we do not like to place gold over it, and where it is not sufficiently approached so that we feel authorized to go in and destroy the vitality of the pulp. In many of these cavities porcelain can be placed with the certainty that you are doing the best that can be done for your patient, because you are putting in a piece of porcelain with a thin layer of cement as an alternative for a cement filling, not as an alternative for a gold filling. It is exactly in localities of that kind that porcelain is useful. And then, again, it is

useful in the buccal cavities of superior and lower molars; those exceedingly sensitive cavities that go down to the gum line, where it would be manifestly a very great hardship, both to the operator and to the patient, to put in a perfect gold filling; where we usually resort to amalgam. In such places I have seen Dr. Jenkins make the most beautiful porcelain fillings, with the certainty that there would be no suffering from thermal changes, because they were overlaid with porcelain instead of metal.

I should like to say a word to Dr. Darby about the matching of shades with the low-fusing porcelain. His experience has been mine also; that we may match a tooth with a little piece of sample porcelain as it comes to us, and that we may not be able to get that shade when we come to bake the powder. And it has been finally driven into my consciousness that I did not make those shades personally; that some other potentiality entered. Therefore I have fused a set of shades myself, and now I bake inlays true to those colors, with greater success.

DR. JOHNSON: Dr. Ottolengui made the statement that he had had more failures in inlay work in those cavities which involve the gingival third of the labial surfaces. I should like to ask him in what particular those fillings failed, whether by displacement or recurrence of decay?

DR. OTTOLENGUI: I have never seen the recurrence of decay around any porcelain filling.

DR. C. S. BUTLER: I shall not undertake to discuss the question of porcelain inlays, but I should like to say a word in regard to gold inlays; not so much on account of my personal experience with them, though I have used them considerably for the last ten or twelve years, and very satisfactorily, but more because of what I have seen of their effects and durability from the hands of another operator. Something like ten years ago there came into my hands as a patient a young lady who in former years had been the patient of Dr. L. S. Straw, of Newburg, N. Y., whom all New York men will remember and whose memory we all revere. In the mouth of this patient Dr. Straw had placed three gold inlays, following the method described by Dr. Darby, except he had anchored them with cement instead of gutta-percha. These cases have been under my observation constantly since 1891, and have been tested under the most trying circumstances, for during the last seven years the lady

has been an extreme invalid, a partial paralytic, and has taken on a great amount of flesh, being unable to assist herself to any great extent. Her whole physical organism has deteriorated; her teeth particularly so. During this time the cavities that were filled with gold and amalgam in similar localities by Dr. Straw and other good dentists have failed, while the gold inlays have remained perfect to this day. I have often felt that this was one of the severest tests of the value of the gold inlay.

In my own practice I have not used them extensively, and only in particular cases. My method—I do not like to use the word "method," but practice—has been to use the inlay the first half or two-thirds of the proximal cavity, never bringing it to the grinding surface of the tooth, and anchoring with cement, and then filling the balance of the cavity with gold, burnishing it over the inlay, leaving the foil filling as the masticating or occluding surface of the tooth. And I have found these operations to be durable, especially where the walls of the bicuspids or molars were frail, as the cement strengthens the walls underneath, and the inlay burnished up to the walls from without protects them admirably; while the foil filling for the masticating surface, being less easily displaced than the inlays, would be, if brought to the grinding surface, very satisfactory.

DR. CRAWFORD: In answer to Dr. Ames's question, I should like to say a word as to the practical value of this method. While I have enjoyed the papers very much this evening, there are two things that we seem to have lost sight of. One is the inability of the dental profession to bake porcelain in small quantities. We have never done it, and we never will successfully. Here and there we find a genius who will do it, but the most of the profession never have succeeded in doing it, and never will.

The other point of practical importance is the attachment of the inlay to the tooth, whether it be gold or porcelain. That has not been particularly touched upon. Gold has the advantage in this particular. You can accomplish the attachment of gold or form attachments in the cavities better than you can with porcelain; and back of the cuspid teeth, above and below, a properly constructed gold inlay is superior to any man's porcelain. Upon the front surfaces of the incisor teeth or the cuspids, where you can get a porcelain inlay and have the porcelain properly supported, that is the

ideal way of doing it, if the porcelain is properly baked and in large quantities. Where gentlemen like Dr. Hinman and Dr. Ottolengui have the means of baking porcelain properly, I grant you they can produce an occasional result that is very satisfactory. I like the gold inlay very much in the back part of the mouth.

The integrity of the cement is another point that is lost sight of. I do not know very much about people who live in other countries, but a very large per cent. of Americans have tartar on their teeth, and we all know that tartar has an affinity for the cement; and a large number of the best successes are attributable to the sealing up of the imperfect joint by the accumulation of tartar. That is true, whether you believe it or not. That is one grand adjunct to the therapeutic value of these things in the back part of the mouth. A good article of cement is better than gutta-percha. Next to amalgam, gutta-percha is the poorest thing ever introduced into dental surgery.

DR. OTTOLENGUI: Dr. Ames asked me a question, and I will just take a moment to answer it. The doctor asked me if gold inlays are to go to the waste-basket, what about porcelain ones? I should like to inform the doctor that I have a special waste-basket in which I put porcelain inlays. Those are the porcelain inlays which are imperfect, and therefore not fit to be set. That is perhaps one reason why I am growing so rich making porcelain inlays, because sometimes I make two or three that I put in the waste-basket before I make one that I put in a tooth. Now, I do not believe that all gentlemen who make gold inlays as imperfectly as I sometimes make porcelain put them in the waste-basket. I think they put them in the mouth. That is my answer. I think there are a few men who have made a few gold inlays that are doing good service, and that they can do it again, but I do not think it is a good practice for the National Dental Association to advise young men to adopt. They might better learn to fill the teeth with gold, like the rest of us.

DR. CROUSE: The last speaker voiced my sentiments. I went to the meeting of the National last year expecting to find something that I had always lacked. My experience with porcelain inlays runs back quite a long way, but it has not been extensive, because I can generally make a better-looking and more durable filling with less labor by using platinized gold in the front of the mouth

than I can with porcelain. As to the porcelain fillings which were shown at Niagara Falls last year, if I cannot double discount them with the different shades of platinized gold I will give up dentistry. There was nothing in the porcelain operations at the clinics at Niagara that approximated platinized gold.

As to the question of gold inlays, what do you make one for? To save the force on the tooth, as I understand. The proposition is that it takes longer to make a gold inlay than a gold foil filling of the same size, and I think that is correct. Now, by taking non-cohesive gold cylinders you can make a more durable filling, one quite as large or larger than with all cohesive gold, and a filling that will be more durable than any gold or porcelain inlay. The use of non-cohesive gold in the form of cylinders is becoming almost a lost art, but I think it is one of the most useful things in the practice of dentistry.

DR. RHEIN: While agreeing very heartily with the paper of Dr. Johnson in regard to the use and limitation of porcelain work, I want to say a word in reference to the latter part of the paper, and the one that has been receiving most discussion, and that is the question of gold inlays. It has been my good or bad fortune to have seen a rather considerable number of gold inlays that it was necessary to replace with gold fillings, for the very reason that Dr. Johnson stated in his paper, as to the method of construction, the beveling of the edges so that the gold overlaps the enamel surface around the cervical border, leaving a foreign substance, something more than nature had originally placed there, which left a ledge, as it were, for the *débris* to collect in. Now, these particular inlays that I have reference to have come directly from the hands of men who can do the very best operations in contouring teeth with gold. And I want to say further that the only good gold inlay that it has ever been my fortune to see—I refer now to the restoration of one of the posterior approximal portions of one of the posterior teeth—is where a well-inserted gold filling had become loosened on account of a lack of sufficient anchorage, and was replaced by a good cement. I have had such an inlay as this under observation now for about five years, and it has been unattended by any defects; and I attribute that entirely to the fact that it perfectly restored the lost portion of the tooth at the cervical border, a principle that is not followed in the burnishing of an inlay around the cervical bor-

der of the tooth, such as I have seen. I do not doubt that gold inlays can be placed in a great many mouths and remain there for years without any inconvenience or loss or trouble to the teeth, but we know also that in a very large number of mouths the most imperfect filling will remain in this condition; and, as far as clinical experience goes, I most strongly emphasize the position taken by Drs. Ottolengui and Crouse, and the other gentlemen who have taken that position, that it is very detrimental to the education of the rising dentist of the future to advocate such a method as this, which is so liable to be ill-used and misused, although it is possible to preserve certain classes of teeth in this manner. In my own estimation there is no comparison between a well-inserted gold filling and an inlay of this character for durability. It does not necessarily mean any lessening in work to the operator when the gross amount of the labor is considered, and the discomfort to the patient is a question entirely between the capability of the operator and the strength of the patient. At the same time I should like also to emphasize what Dr. Crouse said of the superior value of platinized gold in the anterior part of the mouth, especially in the incisal edges, in preference to any form of porcelain that can be used in these particular positions.

DR. JOHNSON: Just one word, and that relates to a slight mistake that Dr. Rhein has made in his understanding of my paper. When I referred to overlapping of margins or beveling of margins, those who particularly noticed the paper will recall that I specially mentioned those margins toward the occlusal surfaces. If we leave any overhang whatever in the gingival portion under the gum we know that the irritation that he has referred to will occur.

I want also to say that in referring to gold inlays I meant solid gold inlays, and not shell inlays under which is a large mass of cement or gutta-percha. I do not believe that we can depend on that particular kind of inlay.

And I should like to emphasize the fact that I do not want to seem to be too great an advocate of inlays. I did not think I should ever have to say one word in this organization in defense of inlays. I was the only member of the society last year that said anything against inlays. Notwithstanding I agree with Dr. Crouse and Dr. Ottolengui and the others who have spoken of the superiority of gold fillings, I still believe that there are cases where we can successfully and advisedly use inlays.

SECTION III.—Continued.

A Method of Preparing Distal Cavities in Cuspids.

PAPER BY E. K. WEDELSTAEDT, OF THE SECTION.

PROLOGUE.

MR. PRESIDENT AND GENTLEMEN: The essay which I shall read for your consideration was written in August, 1899. When it was finished I desired some data regarding the method of right-angle anchorages for approximo-incisal fillings. As the late Dr. Geo. H. Cushing was the first to call my attention to the necessity of using such an anchorage for these fillings, I wrote him for data, and asked that he take part in the discussion of this essay. Dr. Cushing wrote, "For thirty-five or more years I have used a right-angle anchorage in central incisors for approximo-incisal fillings. In fact, I feel as though I had always used it, for it is the only rational anchorage to use for these fillings." He could not or would not tell me who originated this method. This latter information I was most anxious to obtain, for the reason that Dr. Cushing had prepared and sent me a cavity in an extracted central incisor which illustrated the method to which he had called my attention. The tooth with the prepared cavity I had used in instructing other practitioners, and these called this manner of preparation "the Cushing method." But on May 25, 1900, this mighty man closed his chapter, and thus the data which I wished must be obtained elsewhere. I have never heard of applying this method to distal cavities in cuspids, nor did Dr. Cushing or anybody else suggest it. So far as I know, attention has never been called to applying this method to cuspids.

Before I read my essay, I wish to say that with the death of Dr.

Cushing the dental profession has lost the greatest teacher of operative dentistry that the world has ever known. He was to operative dentistry what the renowned Dr. Black is to pathology, without a peer.

Dr. Black once said to me, "When Dr. Cushing finishes a filling nothing remains to be done." What more can be said?

I trust a movement will be inaugurated by the members of this society that will have for its end the erection of a suitable monument to the memory of this great man. Surely his work for the benefit of our profession deserves some recognition from us.

A Method of Preparing Distal Cavities in Cuspids.

Until five years ago many difficulties were encountered whenever it was necessary for me to fill a cavity in the distal surface of

Fig. 1.

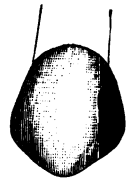


Fig. 2.

an upper left cuspid. Beginning in 1885, an effort was made to obtain a more simple preparation for these cavities. Older operators were continually questioned regarding their methods. Some of their methods were tried, but discarded, as they were lacking in some fundamental principle.

Somewhat over five years ago I applied the principles of a right-angle anchorage to one of the cavities in this tooth. The results were most satisfactory. From that time to this I have applied the same method of preparation to a large number of these cavities. When an invitation came for an essay to be read to your members I consulted some of the men in Minnesota who are familiar with this method, both by study and practice, and it was thought best that your attention should be called to it. What is said in this essay relates to making permanent work for patients who are more than eighteen years of age.

Fig. 1 is that of an ordinary-shaped cuspid. Where there is a cavity in the distal surface of such a tooth it is prepared the same

as an approximo-occlusal cavity, by shortening the distal cutting-edge and making a substantial step. An incisal anchorage is then made in the main body of the tooth. The dark portion in this illustration represents a labial view of one method of preparing these cavities, which I have made use of in the past and which I still use. The lined extension illustrates another method that was in use for some years, but which was given up on account of the difficulty of making and securely filling the retaining pit toward the incisal. The dotted lines show to what extent the tooth can be shortened to obtain a step and incisal anchorage.

Fig. 2 represents a labial section of the tooth with the filling in position. The method is so simple that it is not necessary to go into detail.

The same principles that are used in filling mesial and distal cavities in bicuspids and molars are applicable to these operations. The occlusion of the teeth should be studied, so that we may obtain adequate ideas of how much stress a filling in this position will be compelled to sustain. The size of the step at the incisal must be governed by the occlusion of the teeth. The anchorage pit should be made in the dentin. The seat of the gingiva should be broad and flat. Extension for prevention must be fully carried out, so that when the filling is completed there will be no "retention centers" to hold the food.

Argument.

On looking at the labial surface of cuspids we shall find a prominent ridge. This is known as the labial ridge, and it is higher than any other part of the tooth. The enamel slopes away to the mesial and distal from this ridge. Any filling, therefore, which is placed in the distal surface of an upper cuspid is not likely to be seen by a person who stands in front of the patients for whom these operations have been made. On this account esthetic principles, and those also of conserving tooth-substance, need not be given that consideration which would be necessary if the cavity were differently situated.

Where these principles are applied a cavity of the greatest simplicity is the result, consequently each step of the operation can be carefully considered as the work progresses, and failure should not result if the requisite care has been given to the work. I have yet to have my first failure.

For a number of years a few have contended that the more simply cavities are prepared, the greater the chances for making more perfect work; that deep and inaccessible retention pits increase the chances for making imperfect work and having failure later on. I believe that the largest number of failures in fillings (in proportion to the number of teeth filled) occurs among distal fillings in upper left cuspids. The causes of these failures are known to me. I am not here, however, to discuss the conditions that lead up to this state of affairs, but rather to call your attention to this simple method of preparing these troublesome cavities. By following it failure should not be so likely to take place, as the entire operation is reduced to one of extreme simplicity.

Where these principles of cavity preparation have been applied it has taken but ninety minutes to prepare and fill the cavity and finish the filling. It may be well for us to think over this saving of time.

The gingival third of a number of these cavities has been filled with non-annealed gold, according to the method illustrated in the 1891 *Dental Cosmos,* page 537, to which attention has been called by Dr. G. V. Black.

In conclusion, I desire to say that within the past six months I have attended a few dental meetings, where I have had the pleasure of advancing the teachings of my master. At one of these meetings a man, supposedly a dentist, arose and asked, "Did not the men practicing dentistry forty years ago save teeth?"

"They did," was the answer.

He then replied, "Well, if they did, the methods and principles used then are good enough now."

This essay was not written for the dentists who are believers in such obsolete principles. It was written, however, for those who are dissatisfied with the present method of preparing these cavities, and who, like myself, have sought for something better.

I trust the ideas I have presented for your consideration are new, and of some worth to those who have been and are still seeking a more simple way to prepare distal cavities in cuspids.

DISCUSSION.

DR. C. N. JOHNSON: I purpose making the opening of this discussion very brief, for two reasons. One is because I have occupied

the floor enough already, and another is because it does not require very much discussion. I have to thank the essayist for the clear and systematic order in which he has presented this subject, with very little waste of words. His idea has been to simplify the preparation of these cavities, or not so much to simplify the preparation of the cavity as to simplify the insertion and finishing of the filling, if I understand it.

DR. WEDELSTAEDT: That is correct.

DR. JOHNSON: Anything which will simplify our operations is worthy of the most careful consideration, but I fancy there may be some here who will imagine that this is not in the direction of simplifying these operations. To very many this operation may seem more formidable than the operation which is usually performed in the management of these cavities.

I have this to say in that connection: that I do not believe Dr. Wedelstaedt or anybody else would recommend this extensive cutting in all instances, but that in those difficult cases where we have been in the habit of operating under a disadvantage in working around a corner he has presented to us here a method whereby we may overcome that and produce a cavity which is open to access and the filling readily inserted. It does simplify the insertion of the filling. In this, as in everything else, the greatest judgment must be exercised and discrimination used in the selection of cases suitable for this kind of an operation. I have never done this to the extent that the essayist has, in regard to this particular kind of cavity preparation. When he did me the honor to ask me to open the discussion on this paper he said, "I want you to fill some cavities of that kind by this method before you come before the Association." I have been looking for cases that seemed to me to call for this particular kind of cavity preparation since then, and I have not seen one in my practice in that time that has seemed to appeal to me as a case where it was necessary to cut away to produce a step anchorage such as he has indicated. I may find in my practice the first thing when I get home a cavity that will so appeal to me. This is simply thrown out as a suggestion in the direction of discrimination in these cases.

There is another feature that I want to emphasize. This operation will be criticized by some on the basis of the exposure of gold in the anterior part of the mouth. If you will study these cases

in the mouths of your patients you will find that the relation of that distal angle to the point of view of the observer is such that these fillings will not be conspicuous.

In conclusion, I want simply to give a very brief idea as to how I manage many of these distal cases. These cavities on upper cuspids formerly were a bugbear to me, but recently I have been preparing them in the following way: I do not refer to cavities such as are illustrated here, but cavities such as we very often see where that extent of breaking down of the enamel takes place upon the lingual surface instead of upon the labial surface. We more often find the lingual wall of this cavity involved than the labial. In fact, the relation of the cuspid to the bicuspid is such that the decay will go on more rapidly there; and I have frequently found a strong labial wall standing with a cavity leading toward the lingual surface. In that kind of a case I should not cut away the labial plate to produce the step anchorage. I have been managing those as I suppose a great many men have in the past, by cutting directly away from the lingual surface, exposing the cavity widely from its lingual point of view, simply extending it labially far enough to carry the line between enamel and filling where it will be kept clean, and introducing the filling from the lingual aspect. That is one of the most simple operations that I perform in the mouth. It is to me the least tedious of any operation that I perform, from the fact that that particular class of fillings does not require the same degree of density and hardness to withstand attrition that those upon the occlusal surfaces of molars and bicuspids do, and I can therefore introduce a filling with an adequate degree of density by hand pressure with curved instruments, as Dr. Wedelstaedt has referred to. So in those cases I stand erect, and place my mirror toward the lingual side, and taking a right-angle plugger hold it in the palm of the hand with a good, firm grasp,—and for that particular kind of an instrument you want a handle that has some appreciable bulk,—and I force the filling into place with hand pressure. That has, as I have said, recently proved one of the most simple operations that I perform in the mouth.

I simply wish to commend this paper to the careful consideration of the members of this Association. It is one more suggestion in the direction of the many ways of doing these operations which, when done with discrimination and care, will aid us materially in the progress of our work.

DR. FILLEBROWN: I want to call attention to one or two points which have been incidentally mentioned, but which have been brought more forcibly to our attention by Dr. Johnson's last remark. The implication in the paper was that most of these fillings were done by mallet force, ignoring too much the fact that gold was for many years packed serviceably and well by hand pressure, and that it can be and is done to-day.

The other point is to indorse particularly the description that Dr. Johnson has given of filling approximal cavities in cuspids. Dr. Robert Arthur a good many years ago published a book on the prevention of the decay of the teeth, in which he described and illustrated by cuts this very method of cutting away to which Dr. Johnson has alluded here. He applied it to all the six anterior teeth. Early in my practice I read that book, and since have followed that method; and I make it a point in the superior approximal surfaces of the teeth to cut away according to that principle. If there are any here who are not familiar with the illustration and with the argument upon that point, I wish that that book might fall into their hands. I believe that more teeth will be saved by hand pressure, well applied, than by mallet work. When a case needs a large contour that must be exposed to the force of occlusion, no doubt a mallet will make a harder filling, and one that will wear perhaps better than a filling put in by hand pressure; but, so far as adjusting the gold to the surface of the tooth, so far as making it impermeable to moisture, so far as making it preservative of the teeth, I believe that the non-cohesive foil or our present cohesive foil, no further annealed than when taken from the package, will give vastly better results under hand pressure than with the mallet. The students for whose education I am in part responsible have for a number of years now been much disinclined to use the mallet. We do insist upon the use of at least a hand mallet in proper cases, but there is not one filling out of twenty made where the mallet is used scarcely at all. And I will place the results produced by these men, by this method, against any other body of men under the same circumstances. I want to emphasize the statement that art is the concealment of art, and that it can be fully accomplished in a large number of cases by the use of what I call the "Arthur method" because it was from him that I learned it, and by the use of hand pressure. By the skillful use of hand

pressure all the necessity of an angular retaining point is entirely obviated. Dr. Crouse calls my attention to the fact that in the published Transactions of the past year these cuts are reproduced. I know they were reproduced in a book on operative dentistry a few years ago, and are obtainable by any one at any time.

DR. WEEKS: It may be in order in this connection to call attention to the fact that a feature of the clinics this year will be an exhibit of cavity preparation. The object was to bring the matter before the Association, so that the principles could be discussed and, if possible, agreed upon, because there *are* principles underlying cavity preparation. It does not make so much difference whether you cut a cavity one millimeter, or two millimeters, or three millimeters wide: that is a matter of judgment. But there are certain principles underlying the form of the cavity, particularly the retention form, that must prevail in all cavities under certain conditions; and those principles are governed by the conditions that exist in the particular cases. And, as has been said, there are certain cases where these principles must prevail if you would make an enduring filling and make it easily. Those same principles will apply to another cavity which to the casual observer bears no resemblance to this one at all; at the same time the principles are there. I hope that gentlemen in studying these cavities will do so with the idea of trying to discover the principles which underlie the work. The more nearly we recognize those principles the more nearly we shall unify our practice. We will thereby save a great deal of discussion about cavities, where in reality no actual difference exists. It is only the extent to which principles are to be applied.

DR. WEDELSTAEDT: I desire to thank those who have taken part in the discussion of my essay. I do not care to say anything more regarding the principles of cavity preparation to which I have called your attention. There are other papers to be listened to, and at this time I think the less said the better. I thank you for your kind consideration of my paper and its cordial reception.

SECTION III.—Continued.

The Status of Operative Dentistry in 1900.

PAPER BY L. G. NOEL, OF THE SECTION.

NOT long since one of the most prominent old practitioners in the South, in writing of the present status of operative dentistry, made the broad statement that the art of filling carious teeth with gold has reached the acme of perfection. This was to me a somewhat startling announcement, and one the truth of which I am ready to question. In the first place, I doubt if the manufacturers have entirely perfected themselves in the art of refining and preparing gold for the use of the dentist. Granting that they may have very nearly succeeded in producing absolute gold for dental purposes, there may yet be much to learn about the physical properties of the metal which is destined yet to simplify and make easier to both patient and operator the manipulation of this noblest of filling-materials. When we contemplate the labor and difficulty of making large fillings with gold, we cannot think that the highest state of perfection has been attained. Surely some method will be devised, some preparation of plastic or crystal gold invented, that will enable us to fill cavities more rapidly and more perfectly,—perhaps, too, with less force, and consequently with greater ease to the patient. This, then, is one of the urgent needs of the twentieth century. We doubt not that the ingenuity of man will rise to the occasion and supply us with such preparations of gold as we need. This was foreshadowed when three or four years ago at the clinics at this place (Old Point Comfort) half a dozen different preparations of gold foil were exhibited, and manipulated by as many different operators.

BOSTON MEDICAL
MAR 23 1909

We do not think it too chimerical to indulge the hope that the objectionable color of gold foil may yet be overcome without destroying its valuable physical properties, and that we may one day have this precious metal prepared for us in various shades to match the color of the teeth. A feeble attempt to meet this want has been made in the platinized gold, and, building on this idea, some one may yet master the color problem. Our literature has for a year or more been manifesting the general dissatisfaction existing among our more artistic operators over the display of gold in the visible teeth, and the fight that is being waged against the practice of making gold crowns and large contour fillings in such teeth is likely to be kept up until we attain to better methods and better materials. We can but think that the porcelain fad is likely to be carried too far, but such is always the case with every good thing; its use is likely to be carried to the extreme of abuse. This is the most artistic material for buccal and labial cavities, but we cannot approve of porcelain fillings for the grinding-surfaces of the molars and bicuspids; for here color is of little importance, and gold seems to meet all the real requirements in these situations. But for cavities upon the visible surfaces of teeth we hail with delight any material that will meet all the requirements as does gold, or better than gold, and in which we may match the various colors of the human teeth. That this art of porcelain filling may ever be so perfected as to render it adequate to the requirements to be met in approximal fillings remains to be seen. Having unbounded faith in the ingenuity of dentists, we confidently indulge the hope that this may be perfectly accomplished.

We likewise soar upon the tireless wing of faith to the sublime hope that the cements may be so perfected as to supersede all such difficult methods. That cements are to be greatly improved we confidently expect, because we have only to measure the betterment of the past two decades with the status of this material back in the 70's to find great encouragement for the future. The excellent essay on cement presented at our last meeting at Niagara, describing the practical tests made by the writer (Dr. Wedelstaedt) to show the relative permeability by moisture of these materials, was a great stride in the right direction. These simple methods of testing cements have doubtless been useful to hundreds of dentists through the past year, and we must have more work along these

lines. We hope to have yet much valuable work and instruction about cements from such men as Flagg, Black, and others, but it is to be hoped that our young chemists on both sides of the Atlantic will take up the work and keep it up until something definite is arrived at, until we shall no longer hear from men like Drs. Black and Flagg such statements as they have been making in regard to the unsatisfactory state of their knowledge of these cements. The instability of the fluids of oxyphosphate cements—the tendency of these fluids to undergo chemical changes, rendering them unfit for use—has always been a sad defect, rendering them untrustworthy, and relegating them to the domain of the temporary.

The work that has been done on dental alloys has been truly enormous, and the profession should ever honor and revere the men who have given so much of their lives to the study of the combination of metals for this purpose. We shall not attempt to mention these men by name, for obvious reasons. They are well known to you. The work they have accomplished, we say, has been prodigious, but when we compare the teachings of the leaders in this field we find so much variance that we are brought to the conclusion that, great as has been the work, it is small as compared to that which remains to be accomplished. The majority of workers in this field agree upon certain points which have been observed, and we think these may be recorded as scientific facts; and from these we may work forward through the mass of observations, of which we may say that we have no majority agreement, until we shall have reconciled all conflicting opinions and laid these new conclusions aside as so much additional scientific truth. There seems to be a majority agreement that the proportions of silver and tin giving the best results are, in one hundred parts, about as follows: Silver, sixty; tin, forty. The majority agree that an increase of tin above this proportion will retard the setting, increase the shrinkage, and increase the tendency of the material to undergo those slow changes of shape that have been called spheroiding by Dr. J. Smith Dodge, but which Dr. Black has denominated "flow."

Again, the majority agree that the addition to these relative proportions of silver and tin of a small quantity of copper or a small quantity of gold will still further hasten the setting and lessen the shrinkage. This will give us as a formula for a three-metal alloy: Silver, sixty; tin, thirty-five; copper, five; or silver, fifty-seven; tin, forty; gold, three.

Again, it is the consensus of expert opinion that the addition of a small quantity of zinc, say one and one-half to two parts to one hundred, to an alloy of above-named relative proportions will still further hasten the setting, improve the color, and prevent the shrinkage.*

The experts further agree that an alloy works better and produces better results when it has been cut and laid away for some time than when worked immediately after cutting. This has been called "aging"; and since it has furthermore been observed that the same effect may be produced by subjecting the freshly cut alloy to gentle heat or gentle friction, the term "annealing" has been proposed in its stead.

It would, we think, seem more probable that the mercury would unite more readily and thoroughly with the freshly cut particles of the alloy than after their surfaces have become tarnished by union with sulfur, oxygen, and other gases in the atmosphere, but when the consensus of opinion of expert investigators decides a question as this has been decided we must accept the teaching until it can be shown by unanswerable scientific demonstration to be false.

The above are examples of conclusions that we think may be accepted as facts with regard to dental alloys. We shall now proceed to give some examples of differences of opinion between the experts:

(1) There appears to be no agreement as to the best method of fusing together the metals in making alloys, some contending that the tin should be first melted, then the silver added, and lastly the gold, copper, platinum, and other high-fusing metals. The "new departure corps" pour together from a tin scoop the commingled metals into a crucible that has been heated to receive them and well coated with melted borax to prevent the absorption of the metals by the porous vessel.

(2) The differences of opinion about formulæ are endless, and there are numerous differences as to the effect upon alloys of the introduction of small quantities of certain metals,—*e.g.*, some claiming that platinum added in small quantities, say one to three parts in one hundred to almost any silver-tin alloy, will hasten its setting, improve its edge strength, render it easier of amalgamation, and

*The above formulæ are hypothetical, and not stated as good practical proportions.

improve its color. Other eminent authorities (notably Dr. Flagg) deny all these assertions about platinum, and substitute negative statements on each point, adding that platinum is detrimental, rather than beneficial, to any formula.

(3) There is also much diversity of opinion as to the best method of mixing amalgams. Some authorities advocate ascertaining by experiment the amount of mercury required by any particular alloy to obtain the best results, when the relative proportions of alloy and mercury may be weighed out with a delicate pair of scales. It is claimed that better and more uniform results are obtained by placing together in the palm of the hand the right quantity both of alloy and mercury, and kneading them into a plastic mass. Some advocate a thorough trituration in a mortar so as to break up the particles of alloy and bring about a complete melting of it in the mercury. Others think the mortar and pestle useless, and various methods of mixing, such as shaking together in a bottle, hand mixing, etc., have each their advocates.

(4) Some recommend washing the alloy with diluted sulfuric acid, then with soda or ammonia to remove the acid; then amalgamate and rub in a mortar with alcohol. By this process it is claimed the same results may be obtained with freshly cut alloys that can be obtained with alloys that have undergone the aging process. They do not undertake to explain how the acid produces this result; whether it is brought about by the tarnishing of the surfaces of the particles of the alloy by the coating of metallic sulfids thus formed, or how. The fact is merely stated, and presented unexplained.

(5) Authorities differ again as to the methods of manipulating the various amalgams into cavities, some recommending smooth points, some preferring serrated; some using hand pressure, some the mallet; some confining the material in approximal cavities by applying band matrices and leaving them in place until the material sets. We believe we may say that the consensus of expert opinion is unequivocally favorable as to the immense value of amalgams in dental practice, and, while a minority of highly respectable practitioners claim they have no use for amalgam, and do not use it, the majority of dentists consider it a blessing to the human race. A certain class of medical practitioners (mostly homeopathic) make much trouble for the dentists by telling patients they are being

poisoned by the mercury introduced into the system through the amalgam fillings in their teeth, and that certain forms of throat inflammation and nasal catarrh are caused by the mercury absorbed from these fillings. We are sorry to say there are dentists in every community ready to profit by these suggestions from the homeopathic doctors and remove all such amalgam work, substituting gold fillings, gold crowns, and gold bridges for many good amalgam operations that would, if unmolested, do good service for many years. As before remarked, these charges made against amalgam are not sustained, and through a period of twenty-five years of continuous practice the writer of this paper has not observed one single case of ptyalism, throat affection, or any form of neurosis that could be clearly attributable to mercurial poisoning from amalgam. As an index to the status of the profession on this subject at the present day, we cite the paper of Dr. Grady read at the quarterly clinic of the Maryland State Dental Association at Baltimore, and the discussion which followed its reading; also an editorial under the caption "Professional Ignorance," all of which are to be found in the January number of the *Dental Cosmos* for 1900.

We cannot leave this part of our subject without again adverting to the hurtful commercial spirit which prompts the crowning of many molar teeth that could be made more serviceable and comfortable by filling properly with amalgam.

Another crying evil of the present day that needs a severe rebuke is the practice of using non-cohesive gold in the occlusal surfaces of the molar and bicuspid teeth. This mistaken use of non-cohesive gold is frequently made by practitioners who do much good service with it on approximal surfaces, where, from the small amount of friction and attrition it there has to sustain, and for other obvious reasons, it is in many instances preferable to cohesive gold. *We believe the consensus of expert opinion is in favor of cohesive gold for cavities on the occlusal surfaces of the molar and bicuspid teeth.* The cases coming under the observation of the writer where non-cohesive gold has been used in this class of cavities have presented so many failures, so many leaking fillings where particles of gold have come away, or worn away, that we have been led to condemn the practice as untrustworthy, and one belonging to the effete past.

We are led next to inquire into the status of root-filling. With this operation as it is being performed at the present day we have

less satisfaction than any other operation in dentistry. The practice of filling roots with oxychlorid of zinc and cotton fiber is faulty in the extreme. The waxes and resins are difficult to introduce, and deceptive. The same may be said of all the metals, and all forms of metals. Metallic wires are likely to pass beyond the apices of the roots, causing the loss of the teeth. Gutta-percha would be an ideal root-filling if easy of introduction, and if the operator could be sure of perfect adaptation. We believe this material is more favorably regarded by the expert root-fillers than any other, but no form of gutta-percha point has yet been devised having sufficient stiffness and flexibility. We find a sealing up of the apical portion of the canal with chloro-gutta-percha and aristol before introducing the points a good practice, but the uncertainty of effecting a perfect closure of the canal with gutta-percha leaves us still looking for a reliable root-filling.

Three years ago the idea occurred to me to try the thorns of the prickly pear for filling root-canals. This is a cactus-like plant indigenous to the limestone region of Kentucky, Tennessee, and Northern Alabama. Its leaves bear a great many hard, flexible thorns, presenting a great variety of sizes that appear to have been designed by the Creator especially for this purpose. These have been found very satisfactory for filling small round canals, such as we find in the incisors and bicuspids; and sometimes they are serviceable for the canines and upper molars. They should be soaked in creasote before using, and it is best to set them in chloro-gutta-percha. This should be prepared by dissolving forty to fifty grains of aristol to the ounce of chloroform, then using this as a solvent for the gutta-percha. This is to be smeared upon the walls of the root-canal with a smooth platinoid broach. The thorn may be dipped into the solution, and then forced up until it fits the canal tight, when the fibrous portion is to be twisted out, or, if necessary, burred out. This method has been in use in my practice for about three years, and, as far as I have had opportunity to observe, my cases appear to be entirely satisfactory. I have never had an abscess follow after this process of root-filling. It is not suited to all cases, and must not be employed except in cases where the canals are normal and can be almost exactly fitted with the thorns. This method is not suited to canals that have become patulous by chronic abscess, nor to the flattened canals of the anterior roots of lower molars, for obvious reasons.

I have experimented in a few instances with the operation spoken of as pulp-mummification, and the few cases in which I have tried it have been so far satisfactory as to lead me to look to it with hope as to its becoming an established practice for the third molars and for many teeth with crumpled and malformed roots. A lower third molar in my own mouth presenting the peculiarity of having one canal containing a living pulp, the others being dead, was treated by this process last January, and is perfectly comfortable. In all of my cases I have used the prescription of Dr. Söderberg, of Australia, following the details described by Dr. O. E. Houghton, of Brooklyn, in the December number of the *Items of Interest* for 1899.

Before closing this paper I want to say that as I grow older in the practice of dentistry I become more and more enthusiastic about the practice of obtaining space for all approximal fillings by wedging apart with rubber, cotton tapes, cotton, wood, etc., previous to the operation of filling, and thus preserving and restoring the contour of the teeth.

Another conviction that has been gaining strength as years have passed has been that we on this side of the Atlantic have all been using too much gold in the incisor teeth, especially for our delicate female patients. When the enamel is sufficiently unbroken to protect cement from friction in biting, it is a better preserver of these teeth than gold, and a better conserver of color. Since cavities are never extended by recurring decay where cements are employed, we believe a good quality of cement carefully manipulated may be considered as *permanent* as gold, while it is certainly superior as a stopping for arresting decay under the conditions above mentioned.

SECTION III.—Continued.

Treatment of Acute and Chronic Alveolar Abscess.

PAPER BY JOSEPH E. WILKINSON, OF THE SECTION.

AN abscess is the result of death of the pulp which has been invaded by pathogenic germs; decomposition and fermentation take place in the root-canal, degenerating into a condition of purulency, with the resulting development of gases. Heat causes expansion of the gases; this expansion causes pain through pressure on the nerve-filaments at the apex, inflammatory action results, and all the indications of apical pericementitis are present. These inflammatory disturbances cause the tissues covering the root to assume a dark red or purple color.

If this condition goes on unchecked the formation of pus ensues; a destruction of cellular tissue goes on in all directions. There is increased soreness; the gum, a dark red, now assumes a tumid appearance. In the more advanced stages there are signs of swelling to a great extent; a general rise in temperature and fever are frequently manifested. This action goes on in the adjacent alveolar tissue until the pus finds exit, usually at a point of least resistance, and we have all the conditions of an *acute abscess.*

When the fistula is formed the inflammation subsides. When these pathological conditions exist for a considerable period of time, involving the infiltration of some portion of the alveolar process with purulent matter, and where the abscess has not been of such an active character as to cause the formation of a fistulous opening, it usually becomes *chronic,* and may become confined in a sac or pocket in the apical region or at a distance from the apparent seat of origin, and which is usually known as blind abscess.

TREATMENT.

1. Abortive. When the case presents itself in its early stages, so that this treatment can be used, remove the cause. Open and cleanse thoroughly the canals to the apex. Apply aconite and iodin to the gum; internally administer quinin.

2. Favor pointing of the abscess if above methods prove unavailing by local stimulation, capsicum plasters, etc.

3. Surgical.

First. When an abscess is suspected, after adjustment of the rubber dam secure such a drainage through the root-canal that no stoppage can prevent the free evacuation of the pus. An opening should be made through the pulp-chamber in such a position as to enable the operator to obtain direct access to the roots, and a sufficient amount of tooth-structure cut away so that operating in the root-canals can be done if possible on a line parallel to the direction of the root. The canals should then be opened up and contents thoroughly removed with flexible drills, except in cases where the roots are crooked, rendering perforation likely, and those in which calcification may have taken place. In tortuous canals access to the end of the root can usually be obtained in most cases by a fine, flexible probe lubricated with a drop of oil of cinnamon or carbolic acid. The operator should be guided as to method in each case by his own judgment. Great care must be taken not to force any of the septic matter through the apical foramen.

Rinse thoroughly with peroxid of hydrogen through root-canals; force it through, persisting till effervescence ceases, then wash out with absolute alcohol and dry with hot air and electric canal-drier. Now inject any powerful antiseptic, as carbolic acid, and again dry thoroughly; then place loosely in the canal absorbent cotton saturated with oil of cinnamon. Seal the pulp-chamber with gutta-percha for a week. When comfort is established the dam is again adjusted, dressing removed, and treatment repeated. The canals are now filled. Chloro-percha makes an ideal root-filling, being very permeative, depending on the degree of consistence.

Some of the canals are very fine, and, as the future success of the operation depends largely on the thorough filling of the canal to the apex, to fill them with this solution seems practical. The solution can be carried to the canals with a small broach having a few fibers of cotton wrapped about the end and pumped to the apex. After

the canals are full of this thin solution, thicker gutta-percha is pressed in until there is no doubt of the fluid having gone to the apex. Care should be exercised in doing this, and the patient should be instructed to respond to the first sensation.

In treatment of chronic alveolar abscess, with or without fistula, thorough drainage must be secured; the contents of the root-canals thoroughly removed as previously described, and syringed out with a solution of bichlorid of mercury, followed by a strong solution of pyrozone. If a fistulous opening exists, force the pyrozone through. The canal is then dried thoroughly and oil of cinnamon pumped in, a loose dressing of cotton being placed in canal and sealed with gutta-percha. This treatment must be repeated at intervals of from seven to ten days, until all inflammation has subsided. Then treat as before, and fill with gutta-percha.

In cases which do not respond to ordinary treatment, extraction and replantation should be resorted to. This method of treatment is indicated in (1) roots of teeth the ends of which have become necrosed through persistent alveolar abscess; (2) in teeth where part of a broach protrudes through the end of the root and cannot be removed; (3) teeth in which calcification has taken place, rendering thorough treatment doubtful; (4) perforation of the cementum through any cause; (5) in teeth where canals are too tortuous to permit of proper cleansing. In nearly all these instances persistent abscesses will be the ultimate result.

The tooth should be extracted carefully, so as not to injure the pericementum or check the enamel. Immediately after extraction the tooth should be immersed in a bichlorid solution, and all the affected portions removed. At the same time the socket should be thoroughly syringed out if pus be present, and all antiseptic precautions taken; after which the sockets should be packed with gauze dipped in antiseptic solution until the tooth is ready for replacement. It is often desirable to cut off about a sixteenth of the end of the root, thus leaving a slight space for blood which will accumulate at the apex in forcing the tooth to place. The canals should be opened up and treated and filled as previously described.

After the tooth is replaced it must be held in position firmly by ligatures, or by an appliance constructed from an impression taken previous to extraction. I have resorted to this plan in many instances in which no other method seemed available.

SECTION III.—Continued.

Suggestions for Treating Teeth.

PAPER BY A. C. BREWER, OF THE SECTION.

THIS is a subject about which there has been so much said and so many theories promulgated that it seems impossible to say anything more of practical interest, but I have to offer some practical suggestions based on the universal success and perfect comfort of the teeth treated. We shall deal as much with living teeth as with devitalized pulps and abscesses.

Our first consideration is hypersensitive, deep-seated cavities and approximately exposed pulps. Seventy-five or eighty per cent. of the pulps devitalized come under this head; they come to us with acute pulpitis, or they are so sensitive as to give severe pain to pressure and thermal changes. We hesitate to devitalize, but know that by capping with the old aboriginal methods we must look for a large per cent. of failures. For the treatment of such cases I have been using, ever since it was placed on the market in the United States, Iodo-Formagen cement. In this preparation we have what has been a long-felt want filled, something that is compatible with hypersensitive, deep-seated cavities and approximately exposed pulps. It will relieve pulpitis in a very few minutes, and with a positive assurance of the permanent preservation of pulp. In over one hundred cases I have not had a single failure. I have removed the capping from fourteen of the worst cases that had been capped from a year to eighteen months, and in all but two I was able to place gold and amalgam fillings without any discomfort at the time or since to the present writing. In capping pulps with Formagen cement, prepare the edges of the cavity first,

then cut out carefully all the decalcified dentin without disturbing that immediately over the pulp. Now, with a spoon excavator remove carefully, without exposing the pulp, as much of the decalcified dentin as you can; dry the cavity well, and mix the cement on a flat bottle filled with warm water. This is necessary or the cement will set before you can place it into the cavity, making it necessary to use pressure, which in all cases must be avoided. Use a surplus of cement, and when it has set remove the surplus with a spoon excavator. Now cover the Formagen cement with a quick-setting cement mixed thin, and place into the cavity without pressure. When this is hard, the tooth may be filled with anything you may prefer. As a rule fill with cement for one year, then at the end of this time the filling is partly worn. Cut the cement from the edges as far as desired, and fill it with anything you wish.

Devitalizing Pulps.

There is so much unnecessary pain in devitalizing pulps that we feel impelled to say something. Applications of varnish and cotton, temporary stopping, or gutta-percha are pressed down on the sensitive aching pulp. It is not that every one does not know better, but it seems such a simple operation and temporary in purpose that it is not necessary to go to so much trouble. Excavate the cavity and expose the pulp if possible, then with an exploring instrument place arsenous acid and creasote just where you want it; then take a piece of blotting paper that will just fit the cavity, moisten with any medicament you may prefer, and place in the cavity without pressure. Over this flow a thin, quick-setting cement. Dip your instrument in water and remove the surplus cement. Pulps treated in this way will die without pain in ninety-nine cases out of a hundred, but if there should be any pain twenty grains of ammonal, taken ten grains an hour, will in most cases relieve the patient. If this fails give ten grains of ammonal tablets of codein and camphor. I leave all applications in from a week to ten days. Should there be any peridental inflammation in three or four days, remove the application and open into the pulp. If there is no sensation I remove the pulp and fill at once. Should the pulp be so sensitive as to give the patient too much pain, remove a part of the pulp and pack the cavity with campho-phénique and cotton, when in a few days it can be removed without pain. When

I devitalize pulps I remove and fill at once, in all cases enlarging the canals first with sulfuric acid and broach; then enlarge them again with a screw broach made by the Detroit Dental Mfg. Co., first cutting off the end to prevent them from passing through the apex, filling the roots with Gilbert's temporary stopping, of the following formula:

Gilbert's Stopping, 1 oz.;
Iodoform, 1 dr.;
Paraform, 10 grs., dissolved in chloroform
after the root is well dried.

For this purpose I use copper wires filed down to a fine point, using in a handle made for holding burs. This has the advantage that they are interchangeable. The root being well dried, fill it with dissolved temporary stopping, and follow this with a cone of hard gutta-percha; then take an amalgam plugger (heated) and cut off the cones even with the root part of the teeth. Fill the crown part with oxychlorid of zinc. Roots treated in this way will give neither you nor your patients any trouble in the future.

Abscessed Teeth.

In chronic abscesses first clean out all cavities with sulfuric acid; follow this with bicarbonate of soda. If the abscessed tooth is a molar, take a small blunt probe or a very small amalgam plugger and follow the fistula to the end. This will, in most cases, diagnose which of the roots the abscess is on. Now take a fine broach and open the root through the apex until the patient feels the pain. The best broach for this perhaps is a screw broach, mentioned before. Now take a hypodermic syringe with a curved point; cut off two-thirds of the point; fill the syringe with boiled water; place on the point a cone of unvulcanized red rubber, much larger than the root-canal, and force the water through the root and fistula. Should the water give pain but fail to come through, you may at once decide that it is the other root. This is why I use water first, so as to better diagnose which root the abscess is on. Now open the other root, and force water through that in the same way. When the opening is established with water, fill this with pure carbolic acid,—protect the parts well. Should any of the acid get on the cheeks or lips, an application of alcohol will remove all traces at once. This is the best antidote for carbolic acid ever

used. Now fill this root at once; the other roots should of course be treated in the usual way first. In acute abscesses you cannot force carbolic acid in full strength, but inject them with warm water every day until the swelling and inflammation abate; then treat with carbolic acid and fill at once. In blind abscesses I have had results never obtained before with creasoted charcoal points, enlarging the root with sulfuric acid and Detroit screw broaches, which are just the shape of the points. Fill the root portion with creasoted charcoal points; first bathe the cavity well with pure beechwood creasote, and fill the crown part with oxychlorid of zinc.

These few suggestions, while all are old and none are original, have in my hands so simplified the treatment of teeth as to make it as easy as any other operation.

SECTION III.—Continued.

A Painless Rapid Method of Pulp Extirpation.

DESCRIBED BY EDWIN T. DARBY, OF THE SECTION.

DR. DARBY: Perhaps I can fill in the interim while we are waiting for the presentation of another paper. I wish to present something that is new to me, although it may not be new to others present. Men often think they have something new, but find later on that somebody else has thought of the same thing long before they did. I have often observed in connection with dental society meetings that no matter what new thing is brought forward, there is always somebody to claim it. I remember years ago a dentist said to me, "I can rise in this society and advocate something absurd, and somebody present will say that he has tried it before." The subject of cohesive gold was under consideration, and he arose and said, "I have found that dipping my gold foil in a solution of cider vinegar and then drying it adds very much to the cohesive properties of the gold." He sat down. A man got up and said, "Yes, I indorse all that the gentleman has said. I have been using it for years."

Now, I have a little thing to introduce which, as I have already intimated, may not be new to you. It is a rapid method of anesthetizing and extirpating the pulp. After having exposed the pulp thoroughly, it is touched with a crystal of carbolic acid and partially anesthetized; then the cannula of a small abscess syringe is introduced into the pulp-chamber and equal parts of carbolic acid and chloroform are injected slowly into the pulp. I have the little syringe which I use in my pocket, and I shall be glad to show it to any of you. I have been practicing this method for several months, and in a great many instances I have blanched the pulp to exceeding

whiteness, and extirpated it within one minute after I began making the application. The instrument which I use is not a hypodermic syringe, in that it has no needle. It has a little cannula that is exceedingly small, and it will enter the larger root-canals. As soon as I have partially anesthetized the pulp, I just put the end of this cannula into the pulp-chamber and then pack around it a little temporary stopping. I next draw into the syringe two or three drops of the solution of carbolic acid and chloroform, connect it with the cannula, and by gentle pressure force the carbolic acid and chloroform into the pulp. In every instance where I have tried it I have produced total anesthesia, and been able to extirpate the pulp within a minute or two; and in almost every instance painlessly, the pulp being as white as any skin tissue subjected to alcohol. That is all there is to it, gentlemen. If it is not new, I must beg your pardon for occupying your time needlessly.

DR. OTTOLENGUI: I should like to say that this syringe which the doctor uses is, I think, quite an essential feature of his operation. Curiously enough, while I have not used it, nor used his method, I saw the syringe recently in the office of a friend and liked it so much that I asked where it could be obtained. As a dozen men here have taken the address, I have been asked to announce it. It is Becton, Dickinson & Co., 45 Vesey street, New York city. The doctor has said this is not a hypodermic syringe, but the syringe was shown to me by Dr. Rhein, and on order from him they have made for him regular hypodermic needles, both of gold and of platinum. And he also told me that the platinum needle that he obtained from them was the finest platinum needle that he had ever seen. I believe the syringe was shown at Atlantic City at the American Medical Association.

SECTION III.—Continued.

Measuring Hand Pressure in Packing Gold.

DESCRIBED BY G. V. BLACK, OF THE SECTION.

THE PRESIDENT: Dr. Black will now explain an instrument that he has.

DR. BLACK: I have here an instrument, the dentist's manudynamometer, which is but one of a series of instruments intended to develop our knowledge of physics as applied in dentistry. We have had various instruments along this line, and other instruments are being developed. It was my hope to have presented the companion instrument with this one as well, the tuptodynamometer, but the maker of the instrument spoiled the box at the last minute and I could not bring it along, for the instruments are too valuable to be carried without boxing. Those of you who have been teachers of operative dentistry and perhaps many who have not been teachers of operative dentistry in schools have realized the difficulty of conveying to students a correct impression of the amount of pressure necessary in condensing amalgam or gold fillings when using hand pressure. The object of this instrument is the teaching of that one thing, or conveying to the student a just conception of the pressure required, enabling him to weigh the pressure of his own muscles; and when his teacher says use fifteen pounds, to know just what fifteen pounds means. Heretofore we have had no means whatever of expressing that. We have not had any means of knowing whether my friend here and myself are using equal pressure in condensing our fillings or not. This instrument gives us the opportunity to know. I take an ordinary plugging instrument, using the pen grasp, for instance, which we usually use in handling such instruments; I make pressure here (illustrating). This pencil flies

forward and records the number of pounds pressure. At the same time the paper moves, and I make the pressure again and another record is made, and so on. Any one may weigh his muscles in that way, and be able to convey to pupils who have weighed their own muscles in the same way an exact impression of what is meant by the pressure that we consider best for them to use.

The companion instrument of which I spoke gives a similar record of impact with the use of the mallet, and it will give the variation of impact with various mallets. There are companion instruments for teaching purposes, and when we have a proper chair of applied physics in our dental schools the instruments will belong to the laboratory of that chair. This afternoon I will give as many as may be interested the opportunity of weighing the force of their own muscles in making hand pressure.

DR. CROUSE: Will Dr. Black explain the necessity of that instrument?

DR. BLACK: The necessity is, in the teaching of hand pressure, to know the amount of hand pressure that it is necessary to use. When students take up the use of instruments many of them are simply incapable of making what we consider the necessary pressure, but by putting them into a drill upon that they become capable of doing it very soon. Not only that, but we will find this afternoon that some practitioners who have been in practice for a considerable time perhaps have never been able to use hand pressure sufficient for the purpose of condensing a filling. They have never known it, but the fact is they have not been able to give the necessary pressure.

DR. WATERS: How much pressure will the ordinary tooth take?

DR. BLACK: That pressure is measured by another instrument, the gnathodynamometer, measuring the force of the bite, and in persons who are in normal condition it is never less than one hundred and twenty-five pounds, and in many instances it runs up to two hundred and fifty and even three hundred pounds. We have an instrument which goes into my classes every year, and every student in the school weighs his own pressure of the jaw and the pressure of his individual teeth, or what force he is able to exert in pounds in closing his teeth.

DR. CRAWFORD: That is, with natural teeth.

DR. BLACK: Yes.

DR. CRAWFORD: How much with artificial teeth?

DR. BLACK: Forty pounds is a good pressure.

DR. CRAWFORD: What is the highest you have known?

DR. BLACK: Eighty pounds. I had one gentleman who gave me a pressure of eighty pounds with artificial teeth, but very few persons can give a pressure of more than forty pounds. Any article of food that requires a pressure of more than forty pounds is very difficult for a person to chew with artificial teeth.

DR. OTTOLENGUI: Can you tell us what, in your opinion, is the minimum pressure which should be used in hand pressure in the putting in of gold in a filling? As I understand, that is what this instrument here is to measure.

DR. BLACK: The minimum pressure for actual condensation of gold I think should not be less than fifteen pounds. Of course, for other things than that we may use a less pressure.

DR. CRAWFORD: That will do it, will it?

DR. BLACK: It will do it if you do not use too large masses of gold.

DR. CRAWFORD: Cohesive gold or soft gold?

DR. BLACK: Cohesive or non-cohesive.

DR. CROUSE: How about amalgam?

DR. BLACK: Well, I want twenty pounds. We need more pressure in condensing amalgam than in condensing gold.

SECTION V.

Anatomy, Pathology, and Surgery.

The Evolution of the Complex Molar from the Simple Cone.

PAPER BY ALTON H. THOMPSON, OF THE SECTION.

NO branch of human phylogeny has been so completely and beautifully worked out as that of the evolution of the molar teeth. The brilliant generalizations of our great paleontologists—Cope, Allen, Osborn, Scott, and others—have formulated a hypothesis of cusp evolution which is entirely satisfactory and sufficient to account for the rise and specialization of the various forms of molar teeth as found among mammals, and especially of the teeth of man. "Modern tooth science," says Professor H. F. Osborn,* "springs first from the demonstration of Rütemeyer's hypothesis of 1869, that the teeth of all mammals center around a single, reptile-derived type. . . . The brilliant discoveries of Kukenthal, Leche, and Rose begin to show how, in various ways, the mammals early modified the regular succession of all of the teeth by suppression of parts of the multiple series. . . . Then as to how heterodontism arose as the conic rows of teeth were specialized in different parts of the jaw for three or four functions. After the teeth were thus divided some functions became more important than others and established a monopoly, causing first a marked difference in the relative development of the series, resulting finally in the loss of certain teeth. In the mean time began the special evolu-

*"Rise of the Mammalia," Proc. A. A. A. S., 1893, p. 194.

tion of the form of the back teeth or molars." The molar teeth become differentiated at the later stages of mammalian evolution, for they do not appear, as molars, in lower vertebrates. The function of mastication had not yet appeared, and consequently masticating teeth were not developed until the demand arose for the comminution and insalivation of food.

Grinding or tooth-like organs appear low in the scale of animal life,—as the cusped prominences upon the surface of the stomacholiths of the crustacea and some insects, although very few of the invertebrates possess triturating apparatus of any sort. Crushing teeth first appear in the lowest vertebrates, the fishes, such as the pavement teeth of the rays or the rounded teeth of the wolf-fish, and similar forms. But these are not true masticating teeth; they do not triturate food nor insalivate it. The lizards show the first tendency to tuberculate teeth, which are the beginnings and forerunners of the molar teeth of the mammalia. Even in the lowest mammals, as the duck-bill platypus and some ant-eaters, horny substitutes for teeth are found, true molars not yet being developed. In the Bruta. the sloths and the armadillos, the molars are of simple cylindrical form for crushing and grinding. In the insectivora the molars are highly specialized, with long-pointed cusps for crushing the hard covering of insects. In the carnivora the molars are reduced or aborted, except the lower first molar, which, with some of the premolars, has the tubercles developed into long cutting blades for dividing flesh. In the herbivora the molars are highly elaborated by pleatings and foldings of the tissues to form long crests and ridges, which when worn present a constantly rough face for the effective mastication of resisting vegetable fiber. The carnivora and the herbivora, at the extreme ends of the scale of diet, offer the highest examples of the greatest specialization of the molar teeth, but between these extremes the denture becomes modified for an omnivorous diet. The main dental characteristic of omnivorous animals, as man, bear, dog, etc., is the rounded tubercles upon the molar teeth. The dog is carnivorous with omnivorous modifications, and so has more tuberculate molars, and more of them, than the cat. The hog is herbivorous with omnivorous modifications, and has molars with sharper cusps than the cow or horse. The molars of man are more tuberculate than those of either the dog or the pig, and hence he is more omnivorous than

either. He stands midway in the list between the two extremes of the carnivora on the one hand and the herbivora on the other.

Man is, as regards his general organization, low in the scale of animal structure, for, as Professor Cope said,* "in man the feet yet retain the pentadactyle plantigrade type which characterizes the mammalia of the Puerco epoch and most of the Lower Eocene. His dentition is not lophodont, but simply bunodont, like that of some forms of the Lower Eocene. . . . In his teeth his character is thoroughly primitive. He possesses, in fact, the original quadrituberculate molar with but little modification." Man is, morphologically as regards his dentition, a diphyodont heterodont bunodont of a simple type. His dentition is not so highly organized as either the carnivora or the herbivora, but is of an archaic form (such as is found far back in geological times, and then adapted to a mixed diet), which characterized the generalized progenitors of the highly specialized mammalia of to-day, before the extreme differentiation of these later forms took place.

An analysis of the genetic elements of the structure of the molar teeth shows them to be composed of definite parts, which have been named in reference to the history of their evolution. The original and primitive form of tooth is that of the single, simple cone, as illustrated in the teeth of fishes and reptiles and some mammals, as the Cetacea, which are of simple conical shape without modification (*a*, Fig. 1), which alternate with each other in occlusion. This is the primitive type of tooth, the *haplodont* form, from which all others, even the most complex types of the molars, were derived by modification and duplication of the simple cone in various directions. As Cope said,† "The transition from simple to complex teeth is accomplished by the repetition of the simple cone in various directions. First, there are cylindrical crowns, then flat ones, then divided roots, then internal repetition of root and cusp, then posterior repetition, etc. Very complex teeth, as the multituberculate molars, are formed by both posterior and lateral repetition." Professor O. C. Marsh said years ago,‡ "The primitive form of tooth was clearly a cone, and all others were derived from this.

*"Primary Factors of Organic Evolution," p. 150, and "Origin of the Fittest," p. 268.

†"Origin of the Fittest," p. 241.

‡Proc. A. A. A. S., 1877.

All classes of vertebrates below mammals, many fishes, reptiles, and birds have conical teeth, if any, or some simple modification of this form. The Edentates and Cetaceans retain this type. In the highest mammals the incisors and canines retain the conical shape, and the premolars have only in part been transformed. These gradually change to some complicated molar pattern, and hence are not reduced molars, but transitional forms from the cone to more complex types." Professor Osborn again says,* "The primitive form of the mammalian molar was a single cone, to which all the other cusps have been successively added. The slow transformation of the single-fang, reptilian, conical tooth into the low-crowned molar can be readily shown. . . . In the Eocene mammals we can observe the actual rise, succession, and decline of all of the molar cusps. In the fossil remains between the Trias and the Lower Eocene formations we are, so to speak, in at the birth of every successive cusp, and can observe that the law of cusp evolution is that they are the direct upgrowth from the smooth slopes of the crown, or from the cingule, that fertile parent of new cusps. . . . Every cusp and facet has its value; not as a sign-post for new species perhaps, but as being suggestive of some function or relationship."

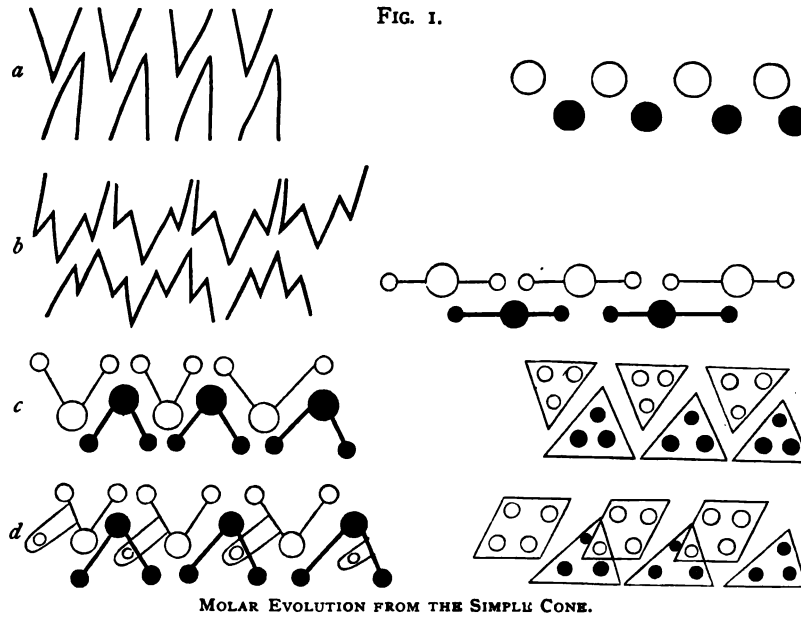
The German theory of cusp evolution is at variance with that of the American anatomists (who have so long held the modern philosophy of tooth evolution from the single cone), and is known as the "concrescence theory" (Osborn, *l. c.*), as expounded by Rose, Kukenthal, Perl, and others, and earlier supported by Gundry, Magitot, and Dybowski. This is the fusion hypothesis, which derives all the teeth, even the multituberculate molars, by the fusing together of numerous single reptilian crowns or cones. Thus a triconodont crown was formed by the bringing together of three reptilian conical crowns (*b*, Fig. 1), quadrituberculate molars by the fusion of four cones, and so on. They hold that there are no exclusively characteristic or structural differences between mammalian and reptilian teeth; that none of the characters of mammalian teeth are perfectly constant; that the dentition of mammals was derived from that of reptiles, etc. From this all of our great paleontologists and anatomists dissent. Osborn says that "three

*"Rise of the Mammalia," and also "The Homology of the Human Molar Cusps," Am. Museum Reports, 1892, p. 740.

main differences are apparent between mammalian and reptilian teeth,—viz, (1) in the capacity of mammals for the multiplication of cusps upon the crown; (2) in the divisibility into roots when the crowns become multituberculate, and (3) in the independent origin of the cingule, the parent of the cusps. None of these items are found in the reptiles of any epoch. In this theory of the origin of the premolars and molars Professor Rose has gone far astray from the actual considerations observed in development. It may be especially pointed out that the oldest types had only three or four cusps, while some of the newest types, remote from the reptiles, have as many as twenty-five. Thus the multituberculate molar was not the primitive form, as the fusionists claim, for originally the molar embraced but three single cones arranged in a single line, the triconodont form (*b*, Fig. 1). . . . The fusion hypothesis as applied to mammalian teeth comes from a one-sided morphology which regards only the wonderful, though mutilated, chapters of embryology, and ignores the equally wonderful pages of paleontology. Because, as said before, between the Trias and the Puerco beds of the cretaceous formations of the Western United States we are in, so to speak, at the birth of every successive cusp, and can assert most positively that the cusps are a direct upgrowth from the smooth slopes of the crown or from the cingule." The concrescence theory is thus opposed by American paleontologists with what they consider the more conclusive evidence furnished by the phylogeny, or the evolutionary history of mammalian teeth. So many wonderful illustrations have been discovered among fossil animals as to tooth evolution by means of the modification and duplication of the primitive cone as to place the principle beyond doubt. This is now the working theory of American paleontologists and anatomists.

Taking the steps of molar evolution in order, we have the following well-defined stages: First, the simple reptilian conical tooth, the ***haplodont*** form, as it is called by anatomists (*a*, Fig. 1). This form of tooth still prevails in the fishes and reptiles and in some mammals, as the Cetacea, and the canines of some higher mammals. The next step was the evolution of cingules leading to cusps upon the sides of the primitive cone, the protocone, making a crown with three cones in a row. This is called the ***triconodont*** form of crown (*b*, Fig. 1). This is still found in the premolars

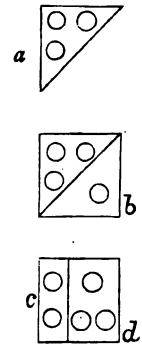
FIG. 1.



MOLAR EVOLUTION FROM THE SIMPLE CONE.

a, the single cone, reptilian, haplodont form.
b, three cones in a row, the triconodont form.
c, three cones in a triangle, the trigonodont crown.
d, the formation of the quadrituberculate crown by the throwing out of the talon from the side of the trigon, which supports the fourth tubercle.

FIG. 2.



THE EVOLUTION OF THE PRIMITIVE HUMAN MOLAR.

a, the trigon of the upper molar.
b, the heel or talon added to the trigon which carries the fourth tubercle, the hypocone.
c, the trigonid of the lower molar with the talonid (*d*), carrying three tubercles.

of the carnivora and insectivora, the molars of seals, and others. The triconodont molar is very primitive, and appears in ancient fossil types. The next step was the shifting of the cones to form a triangle, giving the molar crown that form. This is called the *trigonodont* type, and the triangle with the three cusps is called the *trigon*. In the upper jaw the central cone, the protocone, moved to the lingual side, and the two others, the metacone and the paracone, to the buccal. But in the lower jaw the central cone moved to the buccal side, and the other cones to the lingual, so that the triangles passed each other with a shear-like motion (*c*, Fig. 1). This form of molar was so effective for food reduction that it remained permanent in many forms, as in some of the carnivora, insectivora, lemures, and others. It may be observed to-day in the American opossum, whose upper molars describe perfect triangles. But the more extensive manipulation of some foods demanded an extension of the crown in some animals, so that the next step toward its further elaboration was the throwing out of a heel or *talon* from the side of the triangle (*d*, Fig. 1) to support a cusp which should strike into the valley of the opposing triangle like a pestle in a mortar. This formed the quadrituberculate crown, and from this the molar was further elaborated in different directions by the addition of many cones with tubercles and roots to respond to the increasing demands of mastication in some animals. This is illustrated by the multitubercular molars of the herbivora and the insectivora.

In man, however, the molar teeth remained of a very primitive quadritubercular type. The human upper molar consists only of the trigon (*a*, Fig. 2), to which was added the heel or talon which carries the fourth tubercle or hypocone (*b*, Fig. 2). This tubercle is somewhat erratic in the upper molar teeth of man, sometimes being entirely absent, and the crown being reduced to the tricuspid form, with the trigon alone remaining, which is a very ancient type. This fourth tubercle is quite constant in the first upper molar, is reduced in the second, and is absent in the third, as a rule, in man, especially in the higher races. In the lower molar the *trigonid* (as it is called below) supports but two tubercles (*c*, Fig. 2), one having been lost early in the phylogeny of this tooth; but the heel or talonid (*d*, Fig. 2) supports three tubercles, thus making the five of the lower first molar. In the second, how-

ever, there are but four tubercles, one, the hypoconulid, having been lost from the heel.

A most interesting branch of the study of the evolution of the molar teeth is that of the tritubercular molar, which is the primitive type of molar of all the mammalia, as described by Cope in his brilliant generalizations deduced in his hypothesis of molar evolution called "Trituberculy." He demonstrated that the tritubercular molar was the actual form of molar of those early mammals from which all later forms were derived, which followed the establishment of that conic, triconodont form, which was the most primitive type. Cope said,* "It is now apparent that the type of superior molar which predominated during the Puerco epoch was triangular or tritubercular. This fact is important, as indicating the mode of development of the various types of superior molar teeth. There were two external and one internal cone or tubercle. It exists to-day only in the insectivora and carnivorous Marsupialia (as in the American opossum) and in some carnivora. This triangular upper molar is correlated with a corresponding form of the anterior part of the lower molar. This form of molar I have called the tritubercular sectorial, and it is very variable as to the degree of development of the sectorial cutting-edge. The mechanical action of such triangular teeth is as follows: Of course it results from the form of the superior molar that the spaces between them are wedge-shaped, the apex external, the base toward the palate (*c*, Fig. 1). In the lower jaw the position of the triangle is reversed, and when the jaw is closed these triangular prisms exactly fit the space between the opposite ones. The alternate parts of the inferior and superior molars form an alternate series, as distinguished from the present opposed dentition of the mammalia which was developed from it. In this alternation of the teeth this primitive triangular dentition resembled the reptilian arrangement." From this early triangular form of the molars all later quadritubercular and multitubercular forms were derived by the addition of cones and roots as the necessity arose for the more effective mastication of extended diet.

*"Origin of the Fittest," p. 356.

DISCUSSION.

DR. BARRETT: This is a subject that has interested me for a long time. While I bow to the wisdom of our American paleontologists, I cannot altogether accept their conclusions, nor can I agree with the author of the paper in all his deductions. I am unable to concede that the evolution of the triconodont form from the simple cone has been satisfactorily demonstrated. I am well aware that in some of the paleozoic sharks of the Devonian or Carboniferous ages we have the single conodont form, and springing from the base of that a sub-cone upon each side. This may have been derived from a separation of the cone itself, rather than according to the German theory, the melting together of separate denticles. In fact, the appearance would seem to indicate this, but it seems to me that if one will study the teeth of the Proboscidea,—the mastodons and elephants, they being that form of the Proboscidea with which we are most familiar,—one cannot possibly escape the conclusion that their more highly developed teeth are formed by a melting together of separate plates and separate denticles. For instance, in the elephant you know there never is but one molar on each side of each jaw in full use at the same time. As that gradually comes down and is worn away, another one substitutes it. We find the germs of these teeth back in the body of the jaw itself, and when that is opened these teeth are found as separate plates subsequently to be united into one compound molar by fusing together with cementum. It is this kind of stratification of alternate layers of enamel, dentin, and cementum that makes them so effective as comminutors of the coarse vegetable food that forms the pabulum of this order of animals. If a blackboard had been provided I could show how easy it is for the development of the dental plates of the Proboscidea to be derived from the conodont form through a natural differentiation. Take, if you please, the cuspid tooth of man, and if a section is made across the upper part of the crown we will find a ring of enamel, and within that a solid body of dentin. Outside the enamel, at the cervical portion, we find the investing cementum. These tissues have been so differentiated in the human mouth that the cementum is found only upon the roots, while the enamel is confined to the crown; but in these teeth there has not yet occurred this specialization, and we have cementum, dentin,

and enamel all in the crown of the tooth. That is what distinguishes the peculiar form of the teeth of the graminivora. Cut off or wear off a part of the crown of the human tooth; place two or three of these side by side; unite them by fusing together with cementum, and we have the exact type of the molars of the elephant. If, without this cutting off of the top, we unite a considerable number of such single denticles, compound them together by fusing with cementum, we should have an exact type of the molar of the mastodon, which differs so widely from the elephant.

If we take these as types, and we certainly cannot deny typical forms, I cannot conceive how any man can escape the conclusion that the development of the bunodont forms,—of the tuberculous forms,—as in the mastodon, can be anything else than a fusing together of separate denticles, and not the evolution of a cusp from nothing whatever. You know we have an almost limitless number of examples of simple cones, and it seems to me that the compounding of a number of those cones to form the tuberculate tooth is much more reasonable than the theory of Cope. Especially does this seem the case when we take into consideration the fact that the general type of the bunodont forms of teeth shows the existence of as many roots as there are tubercles in the crown. Sometimes, as in the second premolar of man, two or more roots are melted or consolidated into one, but it is easy to see that the type is a root for every cusp, and that the aberration of the last cusp is indicative of a progressive differentiation. This, too, would appear to demonstrate the truth of the fusing-together theory in the development of the compound forms of teeth.

I am well aware that this is a subject which does not appeal to very many members of the profession, but I wish to say that in the teeth of the herbivora, especially in the teeth of the Proboscidea, there are separate roots for each one of these denticles. Were those roots evolved in the same manner in which the cusps were formed? Generally speaking, I repeat, there exists the same number of roots that there are of cusps. Take the lower molar, if you please, and if there are four cusps there are four roots. There may actually be but three, two of them having fused together; but the original prototype was that of four cusps and four roots, and this is a law which is good, so far as I know, through all comparative anatomy. Hence I cannot conceive that the evolution of the buno-

dont multitubercular forms of teeth can be anything else than a melting together of a number of cones, giving the same number of roots that there are cones, and the same number of cones that there are roots, each one of them being separate. In the elephant the roots are not developed until there is a necessity for their existence; that is, until the body of the molar is so far worn away that a root is essential to its stability, but even then the type is a root for every separate dentinal plate; and the fact that the roots are not formed until a period subsequent to that in which the enamel and dentinal plates are fused together serves but to offer additional testimony confirmative of the compounding hypothesis. Three years ago, when we met here in these rooms, there was the most surprising collection of different tooth-forms that was ever gotten together in America, and there all of this was beautifully illustrated in the jaws of the elephant that were exhibited. I am sorry that this collection, obtained at the cost of so much anxiety for me, was not more fully studied by those in attendance.

The practice of most of us is necessarily a question of bread and butter, and in the study of comparative anatomy there is not so much bread, and certainly no butter; but, all the same, when men like Dr. Thompson will present such a paper as that which he has sent here, it deserves our candid consideration. It is an attempt to reach a higher professional sphere; to attain to something better, something more intellectual, than the mere question of bread and butter, important as I acknowledge that to be. I hope the time is not far distant when we shall have members of the dental profession who will devote their sole energies, as far as they can do so consistently with other duties, to the advancement of science and the increase of knowledge for its own sake. How are we to be a scientific profession unless we study the science of dentistry? The filling of a tooth is not science. There is no erudition in the making of artificial dentures. That is simply professional work. I acknowledge that may be of a high order, but when we become a truly scientific profession we will possess men who devote their lives to study for the mere love of study, not for the earning of a subsistence. The scientific study of dentistry, such as that of which this paper is an exhibit, is the study of dentistry for scientific purposes, and for the mere love of the erudition which should belong to and be a part of every liberal profession.

DR. PATTERSON: I do not rise to speak upon Dr. Thompson's paper, but upon the remarks of Dr. Barrett. I am not a comparative anatomist, but, so far as my reading goes, Dr. Thompson is in the right and Dr. Barrett is in the wrong. However, I do not desire to discuss that question. It was concerning the introductory remarks of Dr. Barrett on the subject of pathology that I wish to speak,—concerning his description of inflammation, where it commences and where it does not commence. His claim that inflammation commences only with the breaking down of the tissue consequent upon the presence of bacteria is contrary to my teaching. I know his friend Professor Roswell Park has embodied in a textbook the ideas of Dr. Barrett in regard to hyperemia and inflammation, but neither Dr. Park's argument nor that of Dr. Barrett convinces me. I believe it is a mere splitting of hairs anyhow. Everything which precedes the breaking down of tissue where we have the destructive bacteria, everything preceding that which we have denominated as belonging to the inflammatory condition heretofore, Dr. Barrett calls hyperemia. I do not believe in changing the description of inflammation which we have had for so many years, and in which hyperemia is named as a symptom, unless we have a very good reason for making such change, because much confusion would result. When there is a traumatic injury, before we have the presence of bacteria, we have redness, pain, destruction of function.

DR. BARRETT: And swelling.

DR. PATTERSON: Well, I did not say swelling, because usually most of the swelling comes after the presence of bacteria. Now, why on earth are we going to say that that process does not belong to inflammation? It certainly does. We have destruction of function, we have redness, heat, swelling, and pain in hyperemia, and surely these symptoms belong to inflammation and are a part of inflammation. What is the use of making the invidious distinction and say that there is no inflammation until the presence of bacteria and the breaking down of tissue? I think it is all nonsense. The old descriptions of inflammation are good enough for me, unless I find better reasons for the change than I have heretofore found.

DR. CLAUDE: I think the word "hyperemia" is simply intended to take the place of the old word "congestion."

DR. PATTERSON: Oh, no; I beg your pardon.

DR. BARRETT: They are quite distinct.

DR. CLAUDE: I thought the word "hyperemia" applied simply to the distension and congestion of the bloodvessels that always precede every form of inflammation.

DR. PATTERSON: Hyperemia is merely an unusual amount of blood in the tissue. Congestion is much different.

DR. CLAUDE: Not according to my conception of it.

DR. BARRETT: If you will bear with me, I want very briefly to make clear the difference that I conceive between hyperemia and inflammation. Dr. Patterson says that he can see no good reason for confining the term "inflammation" to the destructive process. Then is inflammation reparative or destructive, progressive or retrogressive?

DR. PATTERSON: The very definition of the word itself, the word from which it is derived, does not mean a breaking down only.

DR. BARRETT: What does it mean?

DR. PATTERSON: The word "inflammo" means "a kindling, a setting on fire."

DR. BARRETT: Exactly; and that is due to the lack of comprehension of the process when the name was first applied.

DR. PATTERSON: In hyperemia we have a description of one part of the process of inflammation.

DR. BARRETT: That is, according to what you understand by it.

DR. PATTERSON: My understanding is derived from the definition of the word.

DR. BARRETT: Before we comprehended the science of bacteriology, I grant you, we knew no distinction between hyperemia and inflammation. Hyperemia is simply a change in nutrition, is induced by external shock, by any irritant which gives such a shock to the vaso-motor nerves as will change their condition, inducing an increased flow of blood in some instances and a decreased flow in others. There is really no law by which you can say that any certain shock shall induce a contraction of the capillaries. It is as likely to induce expansion as it is to induce contraction, according to the fibers that are affected. Now, hyperemia is the change in nutrition which tends always toward progressive metamorphosis. We have the term "congestion." Congestion means simply a clogging of the arteries, that is all, as one of the steps in hyperemia. Inflammation is an entirely different thing, according to the latest

pathologists. Dr. Patterson objects. We know that he is an old fogy any way. We know that he objects to all changes, and he is one of those who object to change for change's sake. I do not mean to imply by that——.

DR. PATTERSON: I do not care what Dr. Barrett says about me, but let us confine the discussion to the subject-matter in hand. When a man gives the definition of hyperemia which Dr. Barrett has given, I think he is the one who is an "old fogy."

THE PRESIDENT: Gentlemen, you will please confine the discussion to the topic under consideration.

DR. CLAUDE: My understanding of the meaning of the word "hyperemia" is simply an abundance of blood in the bloodvessels.

DR. PATTERSON: Very good, but that is not what Dr. Barrett said.

DR. BARRETT: You did not give me a chance to say what I was going to say.

DR. CLAUDE: Congestion is the same thing. As an illustration, oculists speak of congestion of the conjunctiva. In one locality the word "hyperemia" is used, and in the other the word "congestion" is used. They mean precisely the same thing.

DR. PATTERSON: Oh, no.

DR. CLAUDE: Will you explain the difference?

DR. PATTERSON: The difference has been defined. Congestion is a clogging, a congealing, a stasis of the blood. Hyperemia denotes an unusual rush of blood to a tissue, precedes congestion, and is often present without subsequent congestion.

SECTION V.—Continued.

Antiseptic Surgery of the Mouth and Face.

PAPER BY W. H. G. LOGAN, OF THE SECTION.

IF you please, let us first take under consideration the steps necessary to gain and maintain an aseptic wound about the face. The part needing surgical interference should be first shaved, then scrubbed with a stiff nail-brush and green soap; then cleansed with a two per cent. carbolic acid solution, and lastly bathed freely with absolute alcohol; the patient being previously anesthetized and hair so bandaged that the surgeon cannot get his fingers or instruments in contact with the part, and as a result infect the wound. If during the operation the patient vomits, the wound and the field about should at once be covered with gauze, which is not removed until the parts beyond the surgical field have been made aseptic again. The nausea subsiding, the protecting gauze is removed and the operation finished. The wound is irrigated with a one per cent. carbolic acid solution, and followed by a saturated solution of boric acid; care is taken that all free pieces of tissue, bits of cotton, or tents of gauze are carried away during the process of irrigation. Hemorrhage in this field can as a rule be best controlled by torsion. In case this fails ligate with catgut. Never use a powdered styptic to control hemorrhage which occurs in an aseptic wound; it will prevent union in the parts by first intention. The employment of tampons passed from boiling water to the wound will control the hemorrhage you have occasion to treat about the mouth and face very satisfactorily in a majority of cases, with the pleasant after-result of but slight wound inflammation. You may now close the wound by the employment of horsehair or silk and catgut sutures,

the catgut only to be employed where the wound is very deep. I do not believe it wise to rely upon buried sutures alone in the treatment of wounds about the face, but always use a few horsehair or silk sutures to insure constant coaptation of the edges. Care should be taken that these sutures are not drawn too tight, for the result would be stitch abscesses.

Let us now pass to the dressing of this aseptic wound of the face. Questions of importance are, Should it be a moist or dry dressing? How secured to the part? and period of time dressing is to be employed. Answers: A dry dressing, and secured to the part by the use of flexible collodion to the dried tissue. This dressing is kept in position from five to twelve days, dependent upon the tension about the wound. To prepare the surgical field for its dressing after the sutures are in position, dry the parts and dust thickly over the sutured line with powdered boric acid, which is then moistened with alcohol. The powdered boric acid will, as the alcohol evaporates, practically hermetically seal the exposed edges of our aseptic wound. Now place a few layers of gauze, to be held secure by bandaging where the part will allow. More frequently, however, it will be found necessary to place a fold of absorbent cotton over the layers of gauze, and secure this to the dried tissue by the means of flexible collodion and adhesive plaster strips. The dressing is not to be disturbed without good cause until the stitches are to be removed, which is from the fifth to the eighth day, after which the surface is again prepared as before and a similar dressing replaced for a period of four days, to allow of closure by granulation of the openings caused by the removal of the sutures. Always employ the dry dressing for all aseptic wounds of the face, for the reasons, first, that with a dry dressing you can practically hermetically seal the wound by the procedure spoken of; secondly, because the bacteria brought in contact with the wound by the air cannot propagate without moisture.

We shall now pass to the consideration of the probability and possibility of gaining and maintaining such a condition of a surgical wound in the oral cavity after an operation that infection will not take place from the pyogenic bacteria ever present in the fluids of the oral cavity. Although a quarter of a century has elapsed since the value of aseptic and antiseptic methods of general surgery were brought forward, the benefits derived from following these princi-

ples in the treatment of external wounds can be found detailed in all text-books of surgery of recent date, while the methods and procedure necessary to gain and maintain a condition in and about a surgical wound of the mouth are dismissed with but a line or so, if even spoken of.

What precautions should be taken to prevent the proliferation of the bacteria which are present in the saliva that bathes the wound constantly? This fluid is ordinarily alkaline or neutral, a perfect medium for the growth of the streptococci and staphylococci, which are the main pus-producing germs found as a rule in this field. Cannot the proliferation and activity of these pyogenic germs and their dire effects be best prevented in this field by changing the normal secretions from alkaline, or by producing a condition which will prevent the development of these bacteria? If we can by any harmless method maintain a mild acidity of the fluids which bathe the surgical wound of the mouth without toxic effect, shall we not gain asepsis of the oral cavity by the presence of free oxygen upon the wound's surface?

With the hope of changing the alkaline condition to one of acidity, the powdered acetate of potassium was dusted on the surface of wounds made in the mouths of two dogs for experimental work, with the idea that the salt would decompose and thereby leave liberated acetic acid on the wound surface. The wounds thus treated healed without undue inflammation. No infection occurred, and the wounds looked fresh and clean at each application. The wound of dog No. 1 healed in nine days; of dog No. 2 in ten days.

We experimented also on two dogs with similar wounds in the cheek with the Bac. acidi lactici. The wounds were dusted with this bacillus for the purpose of having ever present over the wound surface a slight acid secretion. Sugar was used with the bacteria merely to dilute it. These wounds healed a trifle slower than those upon which the acetate of potassium was employed, but healed in eleven days. The discharge of secretion was rather pronounced, yet no infection took place. The wound was ever fresh and clean at the various applications.

In the next two dogs, under experiment with like wounds, "oxychlorin" was dusted over the part with the hope of having oxygen liberated constantly on the wound's surface, which would prevent the development of bacteria. The oxychlorin treatment in case

No. 1 did not prevent the formation of pus; a slide made during the second day showed the presence of streptococci and staphylococci. Yet the infection lasted only two days, while the wound healed in ten days without the formation of scar-tissue. The second dog's wound, from like treatment, healed in nine days, and showed a beautiful clean surface at all times. The various wounds were treated three times daily.

This experimental work was carried further by again making like wounds in length and depth in the mouths of these dogs and infecting them with a virulent culture of Staphylococcus pyogenes aureus. The wounds were not treated until the next day, to allow perfect opportunity for the growth of the bacteria.

The wounds under the treatment with oxychlorin showed on the second day of treatment inflammation and a great quantity of pus, while the slide made showed the presence of staphylococci. The inflammation did not cease increasing until the ninth day of treatment had passed, though the pus began to decrease at the end of the seventh day, ceasing in ten days more. The dogs under oxychlorin treatment had to be fed upon a bread and milk diet for twelve days, as a result of the inflammation in the cheek tissue.

In the cases where potassium acetate was employed the inflammation and infection increased for a period of five days only, yet the slides made showed the same infection as in the preceding case. The inflammation and pus secretion practically ended after eleven days; infection controlled in fourteen days.

Reviewing the experiments where the wounds were infected with the same virulent culture of Staphylococcus pyogenes aureus, the slides made the following day showed the same infection. These wounds were dusted on the following day with another culture of bacteria, using the Bac. acidi lactici and sugar. Slight inflammation about the wounds' edges appeared during the fourth day; the afternoon of the fifth day the inflammation began to increase, and continued to increase slowly for three days. When eight days of treatment had passed the inflammation and infection were rapidly subsiding, and on the morning of the tenth day a fresh, clean surface was presented, with but slight oozing of secretions; and slides made on the evening of the eleventh day of the wound that had been dusted with the lactic acid-producing bacillus showed the wound to be free from infection, and healing kindly.

The wounds which were infected with the pus-producing germs

and treated by oxychlorin, potassium acetate, and the lactic acid-producing bacteria (Bac. acidi lactici), showed, in brief, the following conditions:

Under oxychlorin the infection was controlled in seventeen days; pronounced inflammation present, fourteen days; pronounced swelling present, twelve days; bread and milk diet, twelve days.

Under potassium acetate, infection was controlled in fourteen days; pronounced inflammation present, six days; pronounced swelling present, four days; soft food as diet, four days.

Under Bac. acidi lactici and sugar, infection controlled in eleven days; pronounced inflammation not present; pronounced swelling not present; regular diet throughout.

We are led to assume that the reason that wounds under treatment with the lactic acid-producing bacillus and acetate of potassium did so well was because we were able by this procedure to create and maintain more constantly over the wound surface a slightly acid condition instead of an alkaline or neutral one.

In closing, I wish to say I shall carry this experimental work further on similar grounds, including the treatment of the pus-pockets and suppurative conditions which we frequently find about the roots of teeth, using potassium acetate and the lactic acid-producing bacillus to see if we cannot control more quickly the infection in these parts.

Thus are recorded briefly the results of a few experiments aimed at the noble cause of gaining asepsis of the oral cavity.

DISCUSSION.

DR. RHEIN: The subject presented to us by Dr. Logan is one that in my opinion is very timely brought before this Association. The experiments which he has carried out in the short time at his disposal have shown so much value, as illustrated by what he has said, that it leaves before us a very vivid picture of what should long ago have been accomplished in this respect by our profession. The field of minor surgery in dentistry is one that no operative dentist can thrust aside. The question of treating pus-pockets of any form, alveolar abscesses, involving more or less of minor surgery, without dwelling on other operations that each individual dentist may decide for himself, whether he choose to go into that or not, leaves before the profession the question of the technique of han-

dling such cases after the operation as a matter of great importance. I do not believe that before the reading of this paper anything of public utterance has ever been given upon this subject. It is a well-known fact that there is a vast difference in the manner of treating wounds in the oral cavity and those in any outside portion of the body. The difficulty of aseptically handling a wound in the oral cavity is one that as dentists we are well acquainted with. We have learned how much longer it takes for a wound of a given size to heal in the mouth than it would on the external portions of the body if handled with the same care and precision. It is on this account that general surgeons look with a great deal of hesitancy upon operations in the oral cavity, and I should not be surprised if many operations done externally upon both the upper and the lower jaw are done in this manner because of the dread of the care of such wounds in the mouth itself, on account of the difficulty of obtaining aseptic conditions with the enormous amount of bacterial influences there at work in conjunction with the moist conditions so favorable for the development of micro-organisms.

The point raised by Dr. Logan, that in an acid medium a large proportion of the forms of micro-organisms that occur in the mouth cannot live, is one which opens a very novel and exhaustive field to us in this line of work, and I see no reason why the experiments begun by him will not lead to some very excellent practical results. The only objection that I can see to following out such a line of practice as he has illustrated in his experiments is the danger of changing the entire fluid contents of the mouth to a slight acidity. Left in this condition for some days, it is a problem that we must consider what effect this slight acidity might have upon the enamel of the teeth. From a chemical standpoint we are well aware that a small amount of acidity is much more dangerous to the integral character of the enamel than a larger percentage. There is, however, no reason why such a treatment as this could not be followed out and the acid effects confined directly to the wound proper, without necessarily rendering the entire oral secretions slightly acid. I only throw out this as a suggestion that entered my mind, as to the possible damage that might result in a treatment of this kind carried out for some length of time where the entire oral secretions would be rendered acid.

It has become very apparent to me while listening to this paper

that as dentists we have been lax in not devoting more of our well-known ingenuity in technical work to this question of the technique that should be pursued in the course of healing wounds in the mouth. I believe the publication of Dr. Logan's paper will be of immeasurable benefit in this respect in awakening the interest of individual men to a field for the exercise of that ingenuity that lies hidden in the mind of every dentist, and which only requires the torch to be applied to awaken a response; and that will bring about a line of technical work in this respect that will place us in a proper scientific position as to how we should care for wounds in the oral cavity.

DR. CLAUDE: I think that all of this experimental work has its value, but I do not believe there is any better protective (antiseptic) than normal saliva. I use the word antiseptic here advisedly, the saliva being an ever-present natural protection against the introduction of disease. Infection comes from causes introduced through the blood and systemic causes. The saliva offers resistance to infection through the mouth. For instance, when a man cuts his finger, if he puts it in his mouth, supposing he has no disease, there is no better treatment than sucking the finger, and no evil results therefrom. If a dog cuts its foot, or gets a splinter in it, the first thing it does is to coat the wound with saliva to protect the wound from external sources of infection. Therefore, although papers of this kind are useful in teaching us to think, I believe there is little danger of sepsis, except through gross carelessness, where the wound is in the mouth. I have never seen any infection from the pulling of a tooth or the treatment of an abscess. The abscess in itself is infectious if its products are introduced into the circulation. The socket of a tooth does not heal up under normal conditions because there is a little piece of bone or foreign matter left there, but I have never seen a case that did not heal up and become practically closed over in ten days except in cases of fracture of the alveolus. If it is a little longer than that, it is because of some foreign matter that has to be removed. If there is infection through the wound, you must often resort to constitutional treatment to cure it; it is in the system and not always local. I believe that the conditions in the mouth when normal are in themselves most favorable to healing, and obtain the best results under hygienic conditions. Of course you see lesions of the teeth due to lactic

and butyric fermentation, due to want of cleanliness of the mouth, or where the mouth is in an acid condition, destroying the alkalinity of the saliva. I am under the impression that pus is acid, and I do not see the value of the treatment suggested unless the acid treatment neutralizes the evil effects of the acid due to the lesion, which might be neutralized by the saliva or by some other method less harmful to the teeth. It appears to me that the acid treatment is not the proper treatment, except that you use an acid harmless to the teeth to neutralize the acid condition present, which could be neutralized with an alkali without doing any harm. There is a danger in the indiscriminate use of antiseptic agents in the mouth, in that by the abuse of them you may overcome and destroy the reparative forces of nature, which are always present in a normal constitution.

DR. JAMES TRUMAN: According to my conception of things, saliva is never an antiseptic. How can it be possible? Saliva is a fluid that is liable to fermentation always. Therefore, it cannot be depended upon in the treatment of wounds.

I wish, however, to say in regard to this paper that I have been more than pleased with the fact that one of our young men has been able to work up this matter as far as he has gone. It is by just this line of work, as I understand it, that this Association is to carry out the results and purposes for which it was formed. When president of the American Dental Association I advocated the formation of commissions in that Association who were willing to work just as this essayist has worked. I think it is a prophecy of a better time with regard to the scientific side of dentistry.

I wish, however, to say that I cannot agree with the idea or statement of the essayist that the oral fluid is alkaline. I have been testing the fluids of the mouth for a good many years, and I have never yet found a decidedly alkaline or acid reaction. Almost invariably they are neutral.

I have my doubts in regard to the action of acids. Some who have applied lactic acid for the treatment of inflammation in the mouth have found to their sorrow that, instead of producing healing of the wound, they have caused violent destruction. I do not question the theory which the essayist has carried out, but there ought always to be a caution to go with it to avoid the excessive use of acids in the mouth for this purpose.

However, the broader question of antisepsis in the mouth is one of the most important, in my estimation, that we have to deal with at the present time, and I am glad that this subject has been brought up. There is no class of men who have anything to do with surgery who are so absolutely careless in the use of instruments and in the treatment of wounds as dentists. When our friend on the other side said he had never seen any injury done by non-treatment, by allowing these wounds to go untreated, under the impression that the saliva acted as an antiseptic, he certainly had not been as unfortunate as others who have followed a similar course. Some forty years ago I saw some of the most severe cases of infection—syphilis—being carried from one patient to another through that want of orderly arrangement of aseptic conditions in the mouth. I have seen necrosis produced by the mere extraction of a tooth. I presume many of you have seen the same. Now, are we to leave our patients to that condition? You will recollect that in a paper some years ago Dr. Hugenschmidt, of Paris, enforced the idea that there was a phagocytic destruction of pathogenic bacteria in the mouth, preventing infection. This has not been fully sustained.

We must endeavor to make all our operations aseptic. What dentist to-day, if he fully understood the principles enunciated in this paper, would attempt to extract a tooth without aseptic precautions? I cannot understand how any one would do it, or how any one after the extraction of a tooth would leave the socket without any treatment whatever. I am well aware that dentists cannot carry out all the surgical precautions that we find in the books. I am also well aware that it is almost impossible to make our instruments aseptic, but the subject must be taught and be learned thoroughly if dentistry is to be practiced as surgeons understand their branch. We cannot go as far as they do; we cannot pretend to get our hands in the same aseptic condition as they assume they get theirs, but we can go as far as possible, and thus endeavor not only to save our patients from infection, but to save ourselves.

That is another important point. Dentists are very careless when they wound themselves externally. They do not take the proper precautions. It is an extremely dangerous business, as you are all very well aware. A friend of mine in the practice of dentistry was kept hovering between life and death for two years

simply because of a wound from a bur. Now, if that can be done outside the mouth, it can be done inside the mouth. Therefore, it is our duty as men, as dentists, as professional men, to carry on the study of this subject of aseptic treatment as thoroughly as we can.

DR. BROPHY: It was long ago recognized by surgeons generally that the mouth, and with this we include the nasal passage, was the center from which infection was distributed to the various parts of the body. So then we have here always to contend with infection or the conditions that lead up to the infection of wounds. It behooves us, therefore, to be extremely cautious prior to making operations; see to it that the cavity is cleansed as thoroughly as possible, and made as nearly aseptic as we can make it. In answer to a proposition made by the last speaker, I would like to state that saliva is always alkaline.

DR. TRUMAN: If I said "saliva," I meant the fluids of the mouth.

DR. BROPHY: I will accept the amendment. Saliva when taken directly from the ducts, as may be done through tubes, is always found to be alkaline. If mingled with the mucus of the mouth and other secretions it may give us often an acid reaction.

The paper presented by Dr. Logan, as has been said, opens a new field for investigation and thought. Quite a number of years ago it occurred to me that our work in the field of prophylaxis, so to speak, or in hygiene, was carried out in a wrong way, or that, in other words, we used improper methods to render the oral cavity free from these bacteria that are so active in destroying the teeth. We find in the mouth a condition somewhat acid, by the fermentation of food, and so forth, and then, in order to prevent this, we make use of alkaline solutions. This, in my opinion, is a mistake. Let me make use of an illustration. We know that the bacteria through their action generate lactic acid, and the lactic acid is the active agent in bringing about the destruction of the teeth. Now, suppose one of you gentlemen had in your yard a tree that bore noxious fruit,—thistles and thorns,—and that you wished to get rid of the fruit. Would you gather those thorns and thistles and destroy them, or would you uproot the tree and get rid of the whole thing? I think you would be likely to uproot the tree. Now, what do we do? Knowing that the bacteria develop only in an alkaline medium, we permit them to develop, and then we add more alkali to destroy the acids which are formed by these germs. But why

not make use of an acid wash of sufficient strength to destroy the germs themselves and prevent the formation of the lactic acid which brings about the destruction of the teeth? Right here we have something that should claim the attention of the very best thought in this Association, and right here, through the line of work carried out by Dr. Logan, assisted no doubt by the experiments of others, we will get right down to a scientific basis, because we are now groping in the dark. We use alkalies to destroy the acids that have been permitted to form through the presence of bacteria.

That is one thought. The next is the care of wounds, which is the topic really under discussion. I think the remarks of the gentleman on the other side of the house, Dr. Claude, were answered by Dr. Truman, in regard to the action of the saliva on wounds. I never regarded saliva as an antiseptic. I regard it as anything but that, because we have wounds in the oral cavity that frequently are subject to infection, and we are required to make use of agencies for the purpose of destroying this infection and bringing about the process of repair. So I believe we have here to contend with the most important part of the human body, so far as infection is concerned, and in managing these wounds it is our duty to see to it that they are not only cleansed, but if they could be sealed up as we seal external wounds, what happy results we would get oftentimes where now we get quite the reverse. If we could put upon their surfaces some agent that would remain there until the wound was healed, we would accomplish the thing that we seek. Unfortunately for us, however, we find that the mucous secretions will loosen anything that we may apply, at least so far as we have been able to discover up to this time. By and by the wound will again be opened and exposed to infection. So we do the best we can with solutions, and manage them to the best of our ability.

But the principal thought that I wished to express when I took the floor was not only to commend the paper to the members of this body for study and for verification by their own experiments, but to suggest to gentlemen engaged in bacteriological work to take up this study of the effects of alkaline washes with a view to correcting the acidity brought about from the presence of bacteria, and to see to it whether it is rational treatment to apply an alkali; because I think it may be a far more rational treatment to make use of a mild acid and prevent the fermentation that we have to contend with.

DR. G. V. I. BROWN: During the last two years I have given this matter quite a little attention, and am convinced that the data upon which we depend with regard to the relative strength of the different antiseptics that we use in the mouth are in a considerable degree unreliable. The experiments upon which I base that statement were performed in the following manner. They are very simple, and can easily be verified. Mouths were rinsed with sterilized water. That, of course, in the test tube gave a mixed culture of bacteria, a very free growth, which was not an indication that the secretions from which it was taken were at all antiseptic in any sense, as has been suggested by a previous speaker. Then the same mouth was rinsed with a solution of bichlorid of mercury, 1 to 2000, which was thought to be as strong a solution as could be used with any degree of safety. This was held in the mouth not less than two minutes by the watch. In a considerable number of cases, and in those which concern us at the present time particularly, the tests taken from the mouth after rinsing with bichlorid of mercury gave no growth. That, then, we would have called, in the ordinary sense of the word, a perfectly sterilized mouth. Immediately after the bichlorid the same mouth was rinsed with a three per cent. solution of carbolic acid, and that was held in the mouth, the same result following, there being no growth in the culture tube. Immediately afterward the same mouth was rinsed with a three per cent. solution of hydrogen dioxid, and the culture taken from the mouth then showed in many instances a very free growth of bacteria. Now, remember, these so-called germicides and antiseptics had been used one after the other successively; the mouth in each case was supposed to be sterilized, and yet following them all, after the use of what was supposed to be still another antiseptic, the result showed a growth. After having used the hydrogen dioxid, if more dioxid of hydrogen or any of the other germicides were used, the result was that the mouth seemed to be quite well sterilized. Now, as a matter of fact, the lesson that this teaches is that in the mouth the mucous cells, the secretions of the mouth, and those things that are constantly present in the mouth resist the action of even the most powerful acids, and prevent their reaching the bacteria which lie underneath the coatings of the surface of the mucous membrane. There was no doubt that the bichlorid destroyed the bacteria with which it came in contact. There

was also no question as to whether the carbolic acid would do the same, but, as a matter of fact, neither of them reached the bacteria that lay underneath. And so if we are seeking for something to sterilize the mouth, we must have something which of itself will have a mechanical property of cleansing, the equivalent of which is supplied by the nascent oxygen set free from the hydrogen dioxid. It does not make any difference whether you use hydrogen dioxid or whether you use a scrubbing brush, or the soap which you use on the surface of the skin, or whether you use any other mechanical procedure, so long as you destroy and remove this coating which prevents the germicide from coming in contact with the bacteria. And that was why I was particularly interested in Dr. Logan's experiments. He has given us there something of a new idea. Our old methods of taking certain drugs and putting them into a test tube and waiting for a number of hours or days, as may be, until the bacteria in that tube were destroyed, and then comparing that result again with certain other drugs is not at all satisfactory. It is not the same kind of thing that we have to deal with in the mouth. The conditions are altogether different. The results are not fit for comparison with a view to the practical purpose of treating wounds in the mouth. The doctor has carried on these experiments, and I hope he will have more to give us another year, with a view to having something in the mouth which will give continued action. That is what we need more than anything else, because no matter how perfectly you sterilize the mouth, it is at all times open to the air; the air passages can reach it, bacteria can get there to reinfect it, and that is another factor which prevents the perfect asepsis of this region, which you need not have in the treatment of a wound elsewhere in the body.

The doctor's suggestion with regard to this permanent dressing would, of course, only apply to certain kinds of wounds, because in cleft-palate operations and operations of that nature the chief danger, I think, or certainly an active danger, lies in the secretions which reach that wound from above through the nasal passages; and I do not suppose he would find it possible to dust the upper side of such a wound in the same way that he has undertaken to cover the wounds in dogs' mouths.

There is only one suggestion which I have to make, hoping that possibly the doctor may feel inclined to try it and report another

year, and that is as to the use of chloro-percha for saturating dressings wherever it may be necessary in large mouth wounds, such as we have frequently after removing portions of necrosed bone, which are in the form of a cavity sufficiently large to allow of being packed with a gauze dressing. Some years ago, in performing abdominal operations on dogs, we found it was difficult to keep the bandages in place after the wound was closed. The dog would either scratch or tear at the bandages, and so we were obliged to resort to the use of a solution of chloro-percha to cover the wound. And we found that the wound would close perfectly under the chloro-percha, and that for wounds exposed to the air it was certainly a very practical dressing. I have used it sometimes in wounds of the mouth by saturating a portion of the gauze in chloro-percha and smoothing it down with my finger upon the surface. Where the wound can be kept dry and where there is no motion of the part caused by the muscles, that has a very good effect. I think we can now safely say that we can satisfy any one who wishes to be satisfied that we do need something which will accomplish that which we have been desiring to accomplish in keeping the wounds of the mouth in an aseptic condition. We have been working very largely on a wrong line, and I trust something will come out of this work of Dr. Logan's to give us permanent beneficial results.

DR. CRAWFORD: I should like to say a word or two on this paper. I am very much obliged to the gentleman for the contribution. It is a very well written paper and well presented, and there are many good things in it. I cannot say that I object to anything in the paper, because there are some things that I do not know about. But I want to say first that this paper, to my mind, suggests a subject that ought to commend itself to the dental societies of the world and to the dental profession. There ought to be in every medical institution in the world, whether it is a dental college, a medical college, or a veterinary college, a man who teaches minor surgery. This paper deals with the questions of minor surgery. Not but that some of the conditions referred to are major in their primary stage, but he is dealing with minor surgery, so called. There ought to be in all of these medical institutions a teacher of minor surgery, from the fact that the fundamental principles underlying the treatment of minor diseases are many times exactly the

same as the fundamental principles that underlie the treatment and cure of major conditions, and the time will come, through the medium of the dental profession, when many of the afflictions to which the human family are subject that are treated surgically will be cured instanter, instead of in many days.

One dressing or one remedy referred to in making dressings was alcohol. I undertake to say that in minor surgery nobody yet has appreciated the full value of alcohol as a means of giving comfort and affording relief to that extent that cure takes place. There is a gentleman on this floor who last Sunday night at twelve o'clock was subjected to local treatment with alcohol for a severe and violent inflammatory action, and from a clinical standpoint it would be well to subject the case to the most critical examination as to its efficiency.

Three weeks ago last Friday a gentleman from the city of Chicago had become infected from a wound upon the little finger. He was a dealer in hides, and he supposed he had become infected from handling hides; and he went to a surgeon, who treated the wound and gave it a surgical dressing. When this gentleman came to Nashville he was wild with pain, and on the train we could not get anything but alcohol. We procured hot and cold water, and giving the wound alternate washings, subjected it to alcohol, and by the time we got to town the pain was entirely relieved.

If I understood one point in the paper, right along in connection with this use of alcohol, the gentleman insisted upon a dry dressing.

DR. LOGAN: Yes.

DR. CRAWFORD: Well, I am not prepared to accept that fully. I am a little inclined, particularly in the dressing of wounds of the mouth, to like the wet dressing the best, and I believe that it ought to be obtained by the application of pure alcohol.

Now, one other point that has been referred to by some of the speakers, as to the idea that there is an element of asepsis or a disinfecting influence produced by the presence of saliva. I am one of those who have for a long time believed that residing in that very mysterious fluid there is a potency to accomplish to some extent the desired condition of asepsis. I want to say to you that all of the functional activities of the body, whether the functions be of the soft tissues or of the hard tissues, look toward asepsis, and it is through that medium that we must look to the reduction of the

germs in the organism, and that the relief of disease which depends upon distinct organisms for its continuation will ultimately come. The alcohol comes in on this line. I was impressed with this several days ago, when I asked an eminent physician what was the best antitoxin, and after pausing and thinking for a moment he said "alcohol." In the Cumberland Mountains and in other sections of this country where venomous reptiles abound,—for instance, the rattlesnake,—let a man be bitten by a rattlesnake, and if you can get no alcohol the man will die; but give him alcohol, saturate him with alcohol, and he will live. There is a profound and significant suggestion in that which is entitled to consideration.

I couple my observations with this remark: that we are rational men, and do not believe in fanaticism, and do not believe in Christian science. We believe in God the Father, God the Son, and God the Holy Ghost, and do not antagonize the Christian doctrine; but we do not believe in the fanaticism which will refuse to allow a man to take medicine for his stomach's sake if he is sick, and yet will let him sit down in a chair and have his teeth plugged. Is it not strange that any one can fail to see that the fundamental treatment of dental caries rests upon the same principle that the reduction of disease in any other part rests upon? We want rational medicine, and, as to the matter of local application and local treatment, we certainly ought to appreciate the fact that the same *modus operandi* applies, so far as fundamental principles are concerned, in the treatment of a disease locally as when we treat it constitutionally. The same laws which govern in one case govern in the other. We cannot do violence to them. We ought to be consistent.

So I say I like to dress wounds with alcohol. Let me give you another illustration. If you will go out and hire some man who is willing to have his fingers burned, let him burn his two forefingers, and then I will let some man who believes in sweet oil and lime apply the dressing which he believes in to one finger and I will treat the other with hot and cold water and alcohol, and if this society does not decide that the alcohol is the most efficient I will quit the practice of dental surgery.

DR. BROPHY: The gentleman has made an imputation which I cannot permit to go unchallenged. He has stated that he succeeded in inducing a Chicago man to make use of alcohol. To the people

here who are not acquainted with the inhabitants of that beautiful city I want to say that such a condition of things would be impossible. (Laughter.)

DR. GEO. W. COOK: Dr. Crawford advocates alcohol so much that I thought I would say something on the subject.

There is one point in the paper about which I think Dr. Logan has been misunderstood. That is, he did not advocate a neutral or alkaline saliva. We know that the fluids of the mouth are acid within a very short time, it matters not what the conditions are. There is a fundamental principle back of all this, it seems to me, physiologically, and that is that there is a substance in the saliva or in the fluids of the body that we are not yet acquainted with. We know but very little about it. That is the action of certain of the proteid compounds, such as potassium, calcium, and those metals that are constantly in the fluids. Their changes produce a great change in the conditions and growth of bacteria. A simple means of testing that is to put the patient for two or three days on such treatment as iodid of potassium, or mercury, or some of those agents, and then begin a study of the micro-organism that is found in the mouth. Ordinarily you will find morphologically a great change.

Now, the line of work that Dr. Logan has followed out is valuable in a great many aspects. First, it goes to the laboratory, where we have to go for all knowledge after all. The science of disease is as variable as the science of life itself. We find it in so many different conditions; we find the action of certain forms of micro-organic life differing so very much in different wounds that we must say that there is something which lies beyond the simple action of bacteria themselves, and the only way that we can determine any scientific knowledge in regard to the matter is by going to the laboratory, as Dr. Logan has done in these experiments, and following them out on a scientific basis. Work of this kind appeals very closely to me, because I have done some of this work; not exactly in this line, but along other lines; that is my reason for going there for our fundamental knowledge. Now, we can scrub the surface of the skin and make an incision, and we do find union taking place there with alcohol better than by putting sterilized water on the parts, for the simple reason that the alcohol removes the oily substance. It gets into the pores, where micro-organisms

are always present, and cleans them of their contents much better than almost anything else that is used. But we cannot always do that in the mouth, for the simple reason that so many people cannot hold any alcoholic substance in their mouths more than a second.

Another point made by the gentleman here, in regard to the healing of wounds of dogs, I wish to speak about. If he would take up the comparative study of the bacteria of dogs and of men he would find that men differ very largely from dogs. Dogs are more cleanly as a rule. And in regard to human saliva, the difference in different individuals makes a great difference in the action of certain micro-organisms. If you take an individual who is of robust health and grow in the saliva of that individual a certain micro-organism and inject that into susceptible animals, and then take the same growth in the saliva of a person suffering with tubercular conditions, you will find that the micro-organism that has been grown in the saliva of the individual of robust health is non-pathogenic in most instances, while that grown in the saliva of the tuberculous patient is of as great virulency as if it was grown in any other favorable medium.

There is another point in regard to sterilizing the mouth with antiseptics, such as carbolic acid and bichlorid of mercury. When we think of the experiments of Koch, who found that it took forty days to kill the spore of the anthrax germ in a five per cent. solution of carbolic acid, we realize that it would be practically useless to try to subject a person to a five per cent. solution for forty days to antisepticize the wound.

The bichlorid solution is of vast importance. There is another point right here, and that is the differential action of different substances on cell life. Certain of the metallic salts act deleteriously upon certain forms of protozoic life, such as the ameba, and those forms of cell life having a thin cell wall are easily penetrated, causing ionic change of certain fluids. We say such substances are antiseptic. But apply the same thing to the lower forms of vegetable life, such as bacteria, and its action upon them is somewhat less active than on the spirogyra. The bichlorid of mercury is perhaps the greatest of any of the things used as antiseptic. There are many agents that are being brought out which I think will soon give us substances that are efficient antiseptics for the mouth, which will act upon micro-organisms in a way that will be detrimental to

their pathogenic action without affecting the higher forms of cell life.

DR. T. B. HARTZELL: I wish to thank Dr. Logan for the able way in which he has presented a subject that is of great interest to the dental profession; of greater interest perhaps than many others, because it has been neglected in the past. I also wish to thank Dr. Barrett for bringing out prominently in his review of the work of his Section a fact that seems to have been overlooked by the profession in the past,—namely, that inflammation is the foundation stone upon which all pathological research must be based. But I wish to go a step in advance of Dr. Barrett and say that we can have as typical an inflammation from a traumatic injury as we can from infection by pathogenic bacteria.

There is one point that I should like to make in regard to the work of the essayist, that the essential features in every inflammation are, the injury, be it what it may, the migration of leucocytes to the point of injury, and repair through the influence of the leucocytes and the fixed cells of the part; that in striving for a surgical dressing of any sort whatsoever we must recognize the value of the recent discoveries of Dr. Adami, of Montreal, who has shown us that there are two classes of leucocytes that perform the work of protecting the body and aid in the upbuilding of new tissue. One is the phagocyte, which absorbs and assimilates bacteria, thereby destroying them; the other a leucocyte which produces an antitoxin capable of destroying the bacteria *in situ*.

As Dr. Cook said a few moments ago, we recognize that there is a something which added to or subtracted from the substance present in the body stimulates the body to greater resistance to disease-causing elements, or subtracts from that resistance. It seems to me that in the light of the facts which have been so ably set before us by Dr. Adami, this ionic compound of which Dr. Cook speaks is merely the product of that leucocyte capable of furnishing this inhibitive fluid which checks the growth of and even destroys bacteria as it comes in contact with them.

We further recognize that there is a positive chemical influence of the bacterial ptomains to attract leucocytes to the site of the injury. We call this influence "chemio-taxis." There are certain drugs that have this same chemio-tactic power. In the past they have been known as the alteratives, and I would now define an

alterative as a drug that has the power of attracting leucocytes to a diseased or inflamed part. This has been empirically recognized in medicine for many years, and we have known that iodin and other drugs of the same class greatly benefit certain inflamed conditions. Why? Because they have the property of stimulating the approach to the diseased area of those leucocytes capable of grappling with and inhibiting or checking inflammation or disease. The granular material seen in the leucocyte near or in the site of an infected area is discharged and neutralizes the poison of infection.

The discovery of antitoxin for the treatment of diphtheria is another application of the knowledge that we now have of the power of this leucocyte to combat disease, and a glance at the manner in which antitoxin is procured will illustrate this principle.

Take a good, strong culture of Klebs-Loeffler bacilli; percolate the ptomain from the culture with water; filter the bacteria from the percolate; inject into the blood of a healthy horse a dose short of the lethal dose. Repeat this injection for a series of months, until you are able perhaps to inject eight hundred times as much of this poisonous ptomain at the end of the series as at the first dose. What have you done? You have slowly increased the number of leucocytes and their power of resistance to such a point that this animal's blood is vastly rich in this material, capable of inhibiting the growth of the Klebs-Loeffler bacilli. Bleed the animal; allow the clot to settle, and the serum thus obtained is so powerfully enriched with this unknown substance capable of checking the growth of diphtheritic bacteria that a small injection of it thrown into the blood of one suffering from diphtheria usually will cause the inhibition of the diphtheritic germs so quickly that the temperature drops from the maximum to normal, or nearly normal, in from ten to twelve hours. What has been done? It would be too slow a process to expect to increase the leucocytes in the blood of a patient suffering from this disease rapidly enough to grapple with the diphtheritic germ directly. So we have taken advantage of this process to immunize the blood of the horse and to so enrich it in this antitoxin compound that a very small dose of the serum taken from such blood is capable of checking the growth and development of the bacteria. Something of the same idea was recognized by Dr. Koch in his efforts to discover something that would inhibit the growth and development of the tubercle bacilli, and it

seems to me that failure in his work was partially due to the fact that he placed the ptomain obtained from tubercular cultures directly in the blood and expected the production of leucocytes to be fast enough and in great enough power to inhibit the growth of the tubercle bacilli there present, whereas the body is unable to respond rapidly enough with the antitoxin to overcome the bacteria.

And now, it seems to me, in striving for a surgical dressing of any sort that a recognition of the vast importance of the cause and process of inflammation is due, especially the manner in which repair takes place, that the wonderful work of the leucocytes should be recognized, and that in striving for a drug or drugs to inhibit the growth of bacteria in an open wound we should endeavor to use such drugs as will aid and not retard the action of the leucocytes.

I thank Dr. Logan for his ably-prepared paper, and also for the fact that he has striven along a new line for the dental profession.

DR. V. H. JACKSON: I should like to detain the Association just a moment. In the first place, speaking directly to the matter of the healing of wounds, and also pointing out the close relationship that should exist between the medical and dental professions, I wish to say that for years we have been successfully treating abscesses, especially in the bony tissues about the apex of the roots of teeth, with full-strength solutions of carbolic acid. A prominent surgeon is now interesting the medical profession by describing a method recently discovered by which he is able to save about fifty per cent. of cases of hip joint disease without operation by the use of carbolic acid; in other words, avoiding a surgical operation in fully fifty per cent. of the cases of hip joint disease by the direct application of ninety-five per cent. solution of carbolic acid. Now, we as dentists ought to know definitely what the physicians are doing in this line, and have it generally understood how long we have been curing bone diseases and abscesses in the bone by the use of carbolic acid. The surgeon in an address made a few days ago before an alumni meeting described the advantages of carbolic acid, and how to use it. Perhaps it may not be amiss to state his method. In hip joint disease he opens down to the diseased bone, opening up the wound thoroughly, scraping the bone if need be, and inserts a section of glass chimney, such as is used with argand burners, through which he bathes the part with ninety-five per cent. solution of carbolic acid. He leaves the tube in place so that he can see

whether there is any pus formed, and if found treats again in the same manner, keeping the tube in place until the healing process is assured. And he demonstrates that alcohol is an antidote for carbolic acid by pouring the full strength acid into his hands and rubbing them together, then having alcohol poured over them, washing them as with water; that is, the alcohol stopped the action of the acid on the tissues. I have for many years used alcohol in the mouth, in the form of tincture of myrrh, as an antidote for carbolic acid burn. The alcohol neutralizes the acid, and the myrrh soothes and protects the excoriated tissue. It is being claimed that alcohol is an antidote for internal carbolic acid poisoning, and is being recommended for this purpose by medical teachers.

DR. CLAUDE: I would rather have made no remarks than to have been so misinterpreted as it appears I have been. Most of the gentlemen who have discussed this subject have seemed to make their remarks more of a criticism of what I said than a criticism of the paper. For instance, I am afraid that Dr. Truman inferred that I never used asepsis with my instruments, and he spoke of the horrible results that were produced by the use of unclean instruments. I agree with him here, except that necrosis is not an infectious disease, and was never introduced by unclean instruments. Necrosis is the result of disease or injury. And I stated, or intended to state, that unless you introduce these unclean instruments and produce disease, that normal saliva is aseptic, and that nature would have been remiss if she had not provided for the nose, mouth, and throat a protection against disease as well as an aid in digestion.

The other point I wished to make was the point that the reader of the paper brought out, that he used vivisection and introduced the disease and apparently had great difficulty in infecting the dogs, and did not eliminate the saliva as an element in curing that disease. I reiterate that I have never seen a case of disease of the mouth or of injury to the mouth that did not heal perfectly in nine or ten days with little or no interference. I did not say that I never used any treatment where there was a wound in the mouth. For instance, I had one case of a ragged, ugly wound produced by falling on a stick, and tearing a large hole through the soft palate. The remedy I applied was nine parts myrrh and one part water. It may have been the alcohol which produced the good result.

Now, the other point was the mechanical treatment. I did not

mean to say that the mouth should not be kept clean. Unless the mouth is kept clean you may have more germs in the mouth than the normal saliva can overcome. They are not in the saliva, but they infect the saliva simply through not keeping the mouth clean.

I did not intend to criticise the paper unfavorably. My effort was to bring out its scientific value. I do not intend to disparage the paper, on account of the labor and effort attending its preparation. I said it was in the right line, in that as it teaches us to think, and the results, as I recollect, sustain the points I have made.

I do not think experiments on dogs of any great value in arriving at treatment for the human being. Dogs eat carrion, bones, and are not choice in the selection, and therefore must possess some inherent power of resistance to the introduction of disease.

In a lecture by Dr. Welch, of Johns Hopkins University, I heard him state that he had a patient from whom whenever he wished he could get a culture of the Klebs bacilli of diphtheria; all he had to do was to take some of the secretions of the mouth of this young man and inject them into a guinea-pig, and that he could get that culture every time. After a year this boy, being very much mortified by the fact, took to chewing tobacco, and after that he could never get the same result.

In conclusion, I don't wish to advocate saliva as an antiseptic, but do think that it is an auto-antiseptic. I would not advocate the treatment of an injury by another's saliva, but think that saliva is a protection against the introduction of disease through the mouth.

DR. LOGAN: I wish to say in closing that the claim was not made that we had solved the question of asepsis of the oral cavity. It was only stated that we believed we were on the right path, and I shall follow the experiments on this line further.

In regard to the saliva being alkaline, or the fluids of the mouth being alkaline, it was stated that the fluids of the oral cavity were neutral or alkaline.

In regard to the dressings for wounds, I wish to say that I still consider a moist dressing the better if the wound is septic, but that dry dressings are indicated for aseptic wounds.

Thanking you all for your attention and kind words of encouragement, I ask you to join me in thanking Dr. Evans, of Chicago, for the valuable aid he gave the essayist in these experiments.

SECTION I.

Prosthetic Dentistry, Crown- and Bridge-Work, Metallurgy, Chemistry, and Orthodontia.

Art in Prosthetic Dentistry.

PAPER BY MARY E. GALLUP, OF THE SECTION.

IT is generally understood to-day among dentists that the term "prosthetic dentistry" applies especially to the mechanical part of the profession. Dental prosthesis is in reality the art of restoring lost natural dental organs for comfort, utility, symmetry, and beauty. This would include nearly all operations performed in the mouth by dentists. The science of dentistry, it would seem, is leading us away from the purely mechanical part. In selecting the subject "Art in Prosthetic Dentistry" I had hoped by models and photographs to give a suggestion of the few points I wish to bring out in this paper. I have been unable to prepare them to my satisfaction. Manipulative art is the basis of true dentistry. It seems to me a mistake of many of our dental schools to require so much specimen work made by the student. I fear it is of little aid for a true test of their ability. Given a practical case for which to supply an artificial denture, it would be a really severe test of artistic ability, common sense, and patience for the student, the future dentist. First, the impression; and what beautiful impressions of the mouth are taken! The student, were he in earnest, would want to know exactly the best manner in which to get a perfect one. He would take a rare delight in making the models as true as possible. The operation of taking the bite would be fascinating,

and the arrangement of the teeth as interesting as the painting of a picture. I am confining myself to what we usually refer to as "mechanical" work; that is, artificial dentures. One may put a tooth in one part of the denture or another with most excellent results, but the test of ability is in arranging and grinding a set of teeth; in working into each tooth a bit of the individuality of the patient for whom they are designed. What a field for wonderful work in that direction awaits us!

Prosthetic dentistry and the novel of the day are much alike. The popular novel of the present is oftentimes not artistic literature. It may have life on every page, be thrilling, but crude as to real artistic literature, yet improbable. It is in art as in literature, undue haste everywhere. In the days of Michael Angelo art, true art, was aimed for. And who can read of that divine artist working on his back to produce those immortal paintings that adorn the ceiling of the Sistine Chapel without a feeling of reverence and sacred joy in the presence of such sublime results of infinite patience? And it was Michael Angelo who said, "Genius is infinite patience." I love to think of him hammering and chiseling out of a solid block that wonderful David. For strength and beauty in sculpture, has there been anything superior? In literature and art we finally turn back to the old for inspiration and superiority. Ancient dentistry was crude, and consisted mostly of surgery, yet the ancients studied nature more truly in an artistic way, for true art is to conceal art. The largest per cent. of artificial teeth that are put into human mouths are beautiful, but false. Why? We live in what may be called the "factory" or "machine" age. Hand work is or has been out of date. We send our errands by lightning to the ends of the earth, and have almost forgotten the use of the pen. This is an age of hustle and bustle. When Columbus was about discovering America there were Venetian monks who spent their whole lives in making a single book; to-day books are made by the hundreds of thousands,—machine-made books. There was a time when everything was made by hand, and the work was stamped by individuality. Chairs, tables, bedsteads, bookshelves, etc., were made for the places they were to occupy. To-day a house is built, put in the hands of a professional decorator and furnisher,—with what result? One feels in many houses as if they were miniature hotels, or, better still, private hotels, with one

family as guests. There is no individuality, only a certain expenditure of money. Individuality is not fashionable. Does not individuality affect the moral character? True style is the impress of individual character. Study the forms of the dentistry of the Phœnicians. Is there not individuality there? Crude, to be sure, but is not definite character there? They studied directly from nature, and the work bears the stamp of truth. The wear and tear of life leaves its mark. A tree that has borne the storms and snows of winter and the sunshine of summer, is sturdy and strong compared with a tender sapling; so is the art that is born from the conflict of stern endeavor. Did one ever see in the mouth of a man or woman sixty years of age absolutely perfect teeth? There is a peculiar wearing away, a slight change of shade, a development of strength or weakness, character or individuality, if you please to term it, an almost indescribable something that takes place in the mouths of humanity which the truly artistic dentist will try to restore if called upon to resort to prosthesis. We all know that the same beautifully perfect factory-made teeth are but the block of marble given us to chisel and hammer; by grinding and forming we may work a bit of individuality into each tooth.

Life is expression. Art is the expression of man's joy in his work. Life is expression. Life is a movement outward, an unfolding, a development. Beginning with the germ, behold how all things that grow develop from within. To obtain a place, a free field, a harmonious expansion for your powers,—this is life. To be tied down, pinned to a task, that is repugnant. And to have the shrill voice of necessity resounding eternally in your ears "do this or starve," is to starve; for to starve the heart, the soul, and all the higher aspirations is to pine away and die. Nature is beauty, and beauty is a gratification, a peace, and a solace to every normal man and woman. Beautiful sounds, beautiful colors, beautiful proportions, beautiful thoughts,—how our souls hunger for them! Mind is only matter with its varied forces, and all beauty is but a symbol of spirit. Art is the expression of man's joy in his work. The man must work with hand and brain, and then out of the joy of this marriage of hand and brain beauty will be born. Blessed is that man who has found work for his individuality. The dean of one of the best dental schools says, "Dentists are born, not made." I believe that true, though only a variant of *"Poeta nascitur, non*

fit." One may have genius and mechanical ability, but if they are not cultivated with patience, if the fingers and brain are not wedded, will any beauty be born? Genius is infinite patience.

Dentistry so long has been classed with the mechanical arts that its truly artistic side has received little attention. It has seemed to me that during the past ten years, like a vast army led by a few brilliant generals, the great societies of the profession have been marching "onward and upward." Not long since I heard a physician remark, "We of the medical profession have it in our hearts to lift up the dental profession, make it more than something mechanical." The good man who made that remark represents many of his kind; honest, but, like the vast majority of the world at large, condemning where he knew very little of what he was so kindly considering missionary ground. We have a noble profession; art if you so please to term it. And is it not an art? Almost as soon as the student crosses the threshold of a laboratory he takes his first impression. Who has not been in an art school, or school of design, and seen the students working, modeling in clay and plaster? Is the dental student taught to make his impressions and models "things of beauty and joys forever"? Does not the efficacy of a perfect denture depend largely upon a careful impression and a well-trimmed model? From the very day when, as students, we are given a piece of modelling compound and an impression tray, and shown how to take an impression, when we are taught to mix plaster and run the impression and trim the model, we join the rank and file of the artist and sculptor. Truly mechanical. Is not much of the work of the painter and sculptor purely mechanical? Emerson said, "If a man shall do a piece of work incomparably better than his fellows, the world will make a pathway to his door, though he live in a forest." And the motto of William Morris was, "Not how cheap, but how good." Gold crowns and factory-made teeth have had both a good and a bad influence on the art of prosthetic dentistry. Some things can be done as well as others, while other things may be done better than some others. The cry is "cheap! cheap!" Dental parlor people make teeth for five dollars. What is the result? Prosthetic dentistry has received a chill. A large number of practitioners devote little or no time to the art, and cheap mechanics are filling the mouths of the public with dentures that make one gasp for breath at the sight. I have a hobby, and my

reward has been so far mostly in a feeling of trying to do the best I can and the kind appreciation of some of the victims. The hobby is this: to study each case presenting itself; the lines of the face, the working of the muscles about the mouth, and to try to get the individual expression, as you would the eyes and mouth for a portrait that you were painting. The mouth is one of the most expressive features of the face, and its possibilities are varied. How easily you can add or subtract ten years from a patient's face by altering the mouth. Break out a bicuspid or incisor! Horrible! The mere twisting of a tooth! I often have amusing scenes demonstrating to my patients these little facts. Many molds of factory-made teeth are beautiful, but is any artificial tooth comparable to a hand-carved one? There is one criticism that is constantly brought against work of this kind,—it is too expensive. How can we expect to benefit society at large when all of this work must necessarily be expensive? It remains for us to educate society to understand that it is not how cheap a thing can be made, but how good. Make it as excellent as it can be made to serve its ends. Cheap products make cheap men. The first thought of socialism is for the worker who makes the thing, not the man who buys it. The man is always of more value than the product of his hands, and to sacrifice the souls of men in order to make cheap things is a very pernicious policy. There is in the dental profession, as in every hive of bees, a goodly number of drones; drones who throw together mechanically an artificial denture, who make a gold cap anything but artistic, and cement it over a badly prepared broken tooth; drones that take the easiest way to get a dollar. I am not sure just what the unpardonable sin is, but I believe it may be the disposition to get a dollar in this easy fashion. To make a business of art is to degrade it.

After one has learned to take a good impression with each different impression-material, to make a fine model with firm and hard plaster, the next thing is the art of restoring normal occlusion. One may work ever so long and so well, an artistic denture may be nearly perfect, and the articulation spoil it all. Normal occlusion of the teeth is one of the most beautiful things in the study of prosthetic dentistry. Do we as dentists reach its perfection?

My message is that of "idealism"; always to be sought for, yet rarely attained. Our "art and science" is that of both the sculptor

and painter; of Angelo and Rubens. Each of us may have only a spark of their genius. That spark needs fostering everywhere, and much in our profession. Form and color is science applied, as we see it in the teeth of the factory. Form and color, selected by the individuality of the worker, adapted to the individuality of the subject, bringing out all that is good and fair in one patient, is art, true art! Perfection in manipulation is the foundation of our profession. Perfection in art is the summit of our attainments. The schools can only point the way. The impulses of our own souls and the emulation of our co-workers can alone lead us to the heights.

DISCUSSION.

DR. C. S. BUTLER: Having been invited by the chairman of this Section to open the discussion on Dr. Gallup's paper, I will endeavor to comply with the request. Under ordinary circumstances it would be a great pleasure for me to do so, as the paper is certainly worthy of very great appreciation, and follows closely in the line of my own ideas in regard to prosthetic dentistry. But, like many of you, I have been ill all day, and am not now in any condition to command consecutive thought, and therefore much that I wish to say must, I fear, be omitted.

There are two points in the paper which I will endeavor to speak upon, and, if I may be permitted to do so, will begin with the close of the paper, where the essayist uses the terms "occlusion" and "articulation" interchangeably, as though they were one and the same thing. I am aware that our Committee on Nomenclature has endeavored to establish the principle that these two terms may be used synonymously, or, rather, that we are to eliminate the word "articulation," using the word "occlusion" as covering both ideas. I have never been in sympathy with this action of our committee, for it seems to me that it takes but a very slight study of philology to convince one that language is not so made. One of the last judgments in philology is that words are merely arbitrary sounds for the expression and communication of ideas. They were absolutely arbitrary in the beginning, but, having become fixed in their application to definite ideas, we cannot change them. Language is not made by using one word to express dissimilar ideas. One word is often used to express a whole group of ideas having a relation to one another, but one word is never used to express ideas of dis-

similar character; and for this reason we should be very careful to insist upon the distinction between occlusion and articulation, for they are certainly separate and clearly defined ideas. The word "occlusion," as I understand it, means not the act of closing the mouth and teeth, but expresses the condition of the mouth and teeth at rest, while "articulation" means the act of closing the mouth; the one passive, the other active. So that the two ideas are in no sense to be expressed by one word.

Considerable time might be spent very profitably in discussing the simple act of articulation, and especially in relation to the construction of artificial dentures. It is a very simple thing in their manufacture to produce good, satisfactory occlusion. (I am not speaking of the esthetic side now.) There are few dentures that are not fairly satisfactory when the mouth is in repose, but the test comes the moment the plate or teeth are thrown into service in the act of mastication. A discussion of this phase of the paper must include a study of the glenoid cavity in all its various stages and ramifications of development, but I will not go into that here.

I do want, however, to emphasize the difference, and I hope the profession will long continue to insist upon the distinction between articulation, one of the most beautiful and instructive studies in comparative dental anatomy and prosthetic dentistry, and occlusion.

The other point in the paper on which I desire to speak is where the essayist relates her method of studying the denture in the mouth of the patient at the chair before completion, rearranging and changing here and there until the proper expression is obtained. I am very glad that this point has been brought out so nicely, because in a recent dental publication one member of our profession took the position in discussing this subject that in his practice he did not feel that it was necessary after obtaining what he called "a good bite" to see the patient again till the case was completed, his contention being that the whole operation is complete when you have obtained a good bite. Just here you can see where the difference comes in between occlusion and articulation. In getting a good bite you get simply a good occlusion, but you have no conception from that occlusion what the case will be in articulation. It seems to me that the true science and art in prosthetic dentistry is in placing these dentures in the mouth of the patient before they are completed and studying them in their relation to the patient,

both in occlusion and in articulation. I cannot conceive of the possibility of producing the highest results in any other way, and in this I am most heartily in accord with the essayist.

DR. TAFT: I can certainly not do less than express my delight at the reading of this paper. It is in a line to which the attention of the profession should certainly be very much more given than hitherto. What is the ordinary method of supplying artificial substitutes for the natural teeth? What is the aim usually? It is simply to put in the mouth in some manner that which shall represent the natural teeth,—representing them how? Simply to show the fact that there are teeth in the mouth. That is too often the case. Now, a few words in regard to true art in the substitution of artificial teeth; that is, the restoration of the features, the symmetry and beauty of the face. How few prepare artificial dentures with a view to carrying out this idea fully. Who of us are patient enough to carry out the methods suggested in the paper? Who are patient enough to take a piece of work in preparation and give due attention to this restoration of natural form, symmetry, and beauty of the face?

The points of which Dr. Butler spoke are very pertinent, but this is a point to which attention should always be given. Some people pursue the practice of dentistry as though no importance were to be attached to the appearance of the face after artificial teeth are introduced. How often do we find that artificial substitutes distort the features and render them, shall I say, almost hideous? The question is important also so far as mastication or insalivation of the food is concerned, but the latter function is only used two, three, or four times a day. The matter of speech is also important, but neither is of greater importance than the proper symmetrical presentation of the human face, as it is constantly under observation. We are looking into each other's faces every moment, and impressions are made by the expression of the face according to whether we regard them as beautiful or as distorted. In one case we say, "How uncomely that appears; there is something strange about that face." Of another we say, "It looks very natural, very symmetrical; it is beautiful." I have known a few dentists who gave special attention to this; who studied expression under the various conditions tc which humanity is subjected in pleasure, in anger, in depression, in sorrow, and all the manifesta-

tions of emotion shown upon the face. In the proper performance of this work reference must be had to these things, and we should understand them as well as the sculptor or the painter; we should study the face in these varying expressions. I have known a few dentists who spent days in the study of particular cases; those few are worthy of emulation and of all praise. I knew one man not a great while ago who spent nearly a whole week before he succeeded in getting an expression of the face of a patient that was satisfactory to the patient and to those of his immediate family, especially his wife. I have known other similar cases. If there is nothing in this, why did Dr. Allen, of former days, spend so much time on this subject? Why did Dr. Bonwill give such attention to the articulation of the teeth and the arrangement of the teeth in the mouth as he did in years gone by? Why have a few others whom I could mention done the same thing, one of whom we have here to-night with us, Dr. Walker? Why is it that this attention is given by a few practitioners while the great body of them give no attention to it, not as much as that given to the making of a symmetrical shoe for the foot or a hat for the head? The makers of those articles do give attention to these things. If a lady goes to select a hat, it must be just so or she will not have it. It must conform to the fashion of the hour, and she strives to obtain the most becoming result. But too many dentists, and too many patients as well, seem to think that anything is good enough to put into the mouth, so far as the effect on the appearance of the face is concerned.

The late Horace Mann, one of the great educators of this nation, had a dentist spend nearly three days arranging the teeth upon a denture so that the proper expression of the face should be restored.

We all admire beautiful features and comely faces,—the symmetrical appearance of the different parts of which the human face is composed. When it has been mutilated by the loss of the teeth, when artificial substitutes are to be replaced, why should we not give attention to this part of our work, in which so high a degree of skill and art may be displayed? But people will say, "Oh, it will cost something." Yes, probably it will. I think Horace Mann paid two hundred and fifty dollars for that set of teeth to which reference has been made. Dr. Corydon Palmer, who is well known to many of you, often devotes several days in

modeling a denture with a view to giving to the face proper form and expression. Dr. Palmer is one of our most successful artists in this direction. I wish I could inspire every dentist to work in this direction to the limit of his abilities. Is it not true that the majority of us are satisfied to insert substitutes for the natural teeth, with little or no regard to the subject of these remarks, regardless of the artistic result? When a patient is presented with a face distorted by the loss of teeth, study the face in its various conditions and note the peculiarities in detail. Study it when it is in repose; study it under the various emotions to which it is subjected, and decide what should be done here and there for the production of the best results.

There are cases, and especially before middle life, in which the removal of the natural teeth does not destroy or mar the face in a very marked degree. In others the symmetry and beauty of the face is in a large degree destroyed by the removal of the teeth. This is more frequently the case after middle life. A marked change takes place in the gums, the jaws, and the muscles of the face around about the mouth.

It is the duty of the dentist in such cases to study these changes; not only to note the loss of tissue, but the impairment of form of each and every part. Study them with a view to repair. It is not always practicable to restore the lost part to its original volume. To do that in many cases does not accomplish the object sought. A compromise in many instances between the original condition and that which secures the best results must be made.

This is a subject to which more attention ought to be given in our colleges. Study of the normal face, study by photographs, by modeling in clay, wax, or some available material, would be of great value to the student in the study of this subject. I apprehend that very few of our schools give any attention in this direction. It would be well if all could appreciate its importance.

Another point of great importance is the function of the teeth as organs of speech. Very frequently, as artificial substitutes are arranged in the mouth, the speech is greatly impaired. This subject should also receive special attention and study by the dentist.

Mastication is another function of the teeth to which special attention should be given. Teeth are frequently so adjusted in the mouth that this work cannot be done in a satisfactory manner.

These three requirements in the substitutes of natural teeth cannot always be fully attained. Teeth may be so adjusted as to make a very good restoration of contour and symmetry and still be defective as masticators and as organs of speech, or both. Indeed, any one of these functions may be attained in a good degree, and in respect to the others failure be the result. In giving attention to one of these the others should not be disregarded. It is not possible in all cases to restore the face perfectly and at the same time have good enunciation of speech and perfect mastication.

These three conditions should always be in mind.

The arrangement of teeth that will secure the clearest enunciation will oftentimes fail in giving the most natural and comely appearance to the face. The same may be said in reference to mastication. It is true that this kind of practice requires time for its proper execution, but it should be given, at least to a far greater extent than is usually done by the average practitioner. Let us, then, in the future give more attention and persistent study in the direction here indicated than in the past.

And one thought further let me emphasize; that is, with regard to the introduction of artificial substitutes in the mouth in advanced age. Quite a large percentage of dentures are put into the mouths of persons after middle life, in declining years, and it is not always easy to know what to do in those cases. I would urge the importance of studying those cases. I spoke of the natural face in middle life, and not the more advanced stages of life, when the muscles and the parts about the face, and the whole body for that matter, have begun to change, in the way of contraction and in other expressions of advancing years, especially where the teeth are lost. This requires very special work sometimes to secure anything like satisfactory results. Perhaps all are aware of the fact that these cases are the most difficult in which to give anything like adequate satisfaction. Perhaps in these cases which come to us late in life it is not so urgent that we endeavor to attain the highest artistic ideals as it is that we endeavor to make them comfortable and to appear reasonably well. You cannot restore them to youth, but we should not for that reason pass the case lightly by and say, "Oh, it is for an old man or an old woman, and it does not make much difference how they look." How often we see artificial dentures in such cases which, so far as appearances are concerned, are conformable

to sixteen or eighteen years of age and put into the mouths of patients of sixty or seventy years. In regard to shape, in regard to color and peculiar conformation, teeth should be made to conform to the age of the patient and to the peculiarities of the case all the way through. All have peculiar conformations, and dentures should be made in accordance with those indications. This cannot be done without giving some attention and close study to each case.

DR. CRAVENS: It is certainly a privilege and a pleasure to have heard this paper. I wish to pay a tribute to the lady for her appeal for high art in prosthetic dentistry. As to the artistic arrangement of teeth, it seems to me that the prosthetic dentist must necessarily be a compound of the portrait painter and the sculptor. How many are such I can scarcely estimate. I think there are very few.

In regard to articulation, I do not know that it would be profitable to go into any dissertation on the differentiation between articulation and occlusion, but in regard to articulation we know, or at least I think I know, that the natural teeth are never in complete articulation until primary abrasion has taken place and there is a slight flattening or formation of articular facets in the enamel at the point of contact or occlusion. And in order that the prosthetic dentist may articulate artificial teeth—that is, in order that he may accomplish complete articulation—he must be able also to reproduce those little articular facets which I have referred to as being established by primary abrasion upon natural teeth. I have a little epigram to offer, which is that *the establishment of primary abrasion is necessary to the accomplishment of complete articulation.* When the dentist does one he does the other. I think that many times when dentists spend a great deal of time in articulating a set of teeth they think they have accomplished what they desire because the plates seem to fit and to adhere closely in the mouth when the teeth are at rest, but when the patient attempts to masticate with them they loosen and are displaced. I think in many instances that is because the dentist has failed to recognize the necessity for mutual adjustment, which is the establishment of primary abrasion, in order to accomplish complete articulation.

DR. GEO. H. WILSON: This paper has pleased me very much because it is by a lady. As a rule we expect that ladies will be more interested in other branches of our work, and that they will

not take up what has been considered by many the humbler part of our profession—that is, prosthetic or mechanical dentistry. I feel that we are honored in having this lady take up this subject and discuss it, because I believe that ladies are more capable of perceiving the fine artistic side of our work than are most men. We will generally find in art to-day that ladies will succeed better than men, if we except a few rare cases in which genius appears to develop more in men than in women; but the general average of women will develop artistic talent better than men. I do not wonder they should do so, because I think they are more given to close observation. If you doubt it just notice two ladies when they meet in the street and pass each other, and when they have passed see if they were not more observing than you.

If we are going to study art we must be close observers. We must know what nature would normally produce, and how to reproduce it in art. That is the foundation of the art study.

I think there is another reason wherein we fail as dentists when we attempt the artistic, and that is a lack of proper interest in the subject. Our tendency is to give prosthetic dentistry over to the laboratory man, who never has an opportunity to study the patient. Consequently there is no chance for him to reproduce what nature designed. The operative dentist feels that this work is beneath him, and, as I say, turns it over to the laboratory man. If we desire to make a success in this line we must recognize prosthodontia as a specialty of dentistry, and then if we are consistent we will send our patients directly to the specialist and not take the impression and then turn it over to the laboratory man to do the work. Then we will place prosthetic dentistry upon the same foundation with the rest of our profession, when it will be in the hands of those who are specially interested in that work.

I disagree with the essayist in saying that it is vulcanite and manufactured teeth which are the great causes of defective prosthetic dentistry to-day. It is simply the way in which we go at it, the fact that we do not put it into the hands of men who are specially fitted for the work. We use it simply as a means of gaining a little money for ourselves without laboring for it. I think that is the great cause of the degradation of prosthodontia.

I should like to call attention to a thought in regard to occlusion and articulation. Occlusion simply means coming together; articu-

lation means grinding, masticating, so that the teeth will come together in the various positions into which the jaw is thrown. It is simply impossible for us to arrange the teeth by the Bonwill method of articulation, so that we can have three points of contact when we have a portion of food between the teeth upon one side. So the Bonwill articulation is absolutely worthless so far as the grinding of food is concerned, because the moment we separate the teeth and place a portion of food between them there is only one point of contact, and that is where the food is. They do not come in contact until the food is penetrated so that there is practically nothing left between them. It is very essential that the patient shall be able to use the mouth in any position, and that the teeth shall not be dislodged. The real object of the Bonwill articulation is the arranging of the teeth so that they will occlude as they do in nature, and the result is good when the mouth is used for speech; but with mastication that is an entirely different thing. Then we must consider another element, and that is leverage. It is not always possible to arrange the teeth as nature designed them and have the leverage so arranged that they will not be displaced. So we must study the great subject of leverage. We must remember that force is always applied in a straight line, and if there is an overbite to any great extent the leverage will be in such a way that it will displace the plate in spite of everything we can do. So we must consider leverage as well as the artistic effect, and, as Dr. Taft says, we will have to compromise many times. So it means a continual study of what is best to be done in the individual case.

The essayist, in speaking of manufactured teeth, says that hand work is superior. I think that in nine hundred and ninety-nine cases in every thousand the work of the best manufacturers is far superior to hand work. I admit gum section teeth are an abomination. There are very few men who are skillful enough to produce hand-carved teeth which can compare with the manufactured work we have at the present time. Of course in the olden time everything was carved. The trouble is not with the manufacturer, because he produces the typical forms of teeth, and that is what is given us. We are to take these typical forms and individualize the teeth by grinding, and if necessary staining with the mineral stains and burning them in so as to reproduce the effects we wish. We must first have a foundation upon which to work, and that founda-

tion is given us by the manufacturer. It is simply impossible for any man to take a piece of china or porcelain and carve it into shape, bake it and know what the color or what the exact size will be if he depends upon hand work, because we know that porcelain will shrink and we know that the color will change according to the amount of heat applied. But when we take the foundation given us by the manufacturer in the typical form of the tooth and individualize it we can produce a very successful result.

The essayist made the statement that the end of art is the concealment of art. That is very true, and that is wherein a study should be made of prosthetic dentistry. I believe that the true foundation for this is that this work should be given into the hands of prosthetic dentists. When I say "prosthetic dentists" I do not mean mechanical dentists. I do not believe in dental laboratories. I think they are contrary to the best interests of our profession. The prosthetic dentist should have full control of the work, and be responsible for all of it; then if it is a failure he cannot lay it to the operator because the operator took a poor impression, and the operator cannot say to the patient, "Well, my mechanical man made a mistake in this."

Another point requires mention; that is, in connection with the amount of technic work required by our colleges in the study of prosthetic dentistry. I think the essayist is wrong about this. The object of technic work is to teach what to do and how to do it. It is not to teach the artistic side. It is simply impossible to teach each student all the varieties of work if we depend solely upon the patients furnished by the dental infirmary; nor would a student know what to do if he were given practical work at first. But if the student is taught in the laboratory, by the use of models and dummies, how to do all the different varieties of mechanical work, step by step, advancing from the simple to the more difficult, he can cover the whole field in a comparatively short time, and then when he comes to the practical work emphasis can be laid upon the artistic side and he will meet with much better results. So I believe the way of teaching in our best schools at present is far superior to the old hap-hazard method.

DR. WALKER: I should like to compliment the lady on the paper that we have had to-night. It was a very excellent one. I wish to reply to a few remarks made on the subject of articulation and

occlusion. It is very gratifying to me to hear how much of the time to-night has been given to that subject. Generally the subject has received practically no attention at our meetings. I am glad to see that it is coming out.

The Committee on Nomenclature of this Association has been striving for years to have the word "articulation" banished from our nomenclature so far as prosthodontia is concerned. I think it is evident to-night that that is a mistake. We do need these two terms to differentiate between articulation and occlusion. They are not the same thing by any means. They have two entirely different meanings. I hope, therefore, this Association will reconsider its former recommendation that the word "articulation" be abandoned and "occlusion" only used instead. By occlusion, as has been said, we mean simply the coming together, the mere contact of the teeth in a position of rest, the locking of the cusps in the position of rest; while by articulation we mean the coming together of those cusps not in the position of rest, but in a position in which they are obliged to slide one upon the other to reach the position of rest. So in closing the natural teeth in mastication we first bring them together in articulation and then slide them to occlusion. Of course there are many who do not attempt to articulate artificial dentures. It is a very difficult thing to do as compared with merely occluding them. But the fact that the majority do not attempt to articulate them is no reason why that word is not necessary for those of us to use who do articulate as well as occlude. I am glad to see that Dr. Butler mentioned this fact. Few have given the extensive study to that feature that he has.

DR. R. H. NONES: I have heard exactly what I expected to hear from a woman. Appreciation of art is nothing else than refinement; a woman I believe to be the embodiment of refinement. If we could inherit a little of that perception of refinement with our natural inheritance of mechanics I think we would better appreciate art. It has been frequently said that vulcanite work is one of the worst curses that was ever introduced into mechanical or prosthetic dentistry, a curse in the sense that it debased the ideals and abilities of the thorough mechanic, so that men are not as well versed in metal work as of old; they are not the workmen they were of old. I would add to that and say that crown- and bridge-work I believe to be the greatest curse ever introduced into dentistry, for

the reason that it has ruined more teeth and debased somewhat the thorough mechanic. But it has done one very good thing of late years, it has carried the younger men particularly back to where some of these older men were; it has brought them to appreciate that they are not the workers in metal or the mechanics that they supposed themselves to be, and as a consequence I believe crown- and bridge-work should be given the credit of this extra interest that has been taken in mechanical or prosthetic dentistry. I agree, too, with the remark that was made that the word "prosthetic" has increased that interest. Very many dentists have neglected the branch of mechanical dentistry, as it was formerly termed, because of its mechanical character, feeling that a man who devoted himself to that branch was nothing more than a mechanic. The new term did away with a great deal of that, and I believe the use of the word "prosthodontia" will also help it; it covers more than the expression "prosthetic dentistry."

Another point in which I concur with the essayist entirely is her appreciation of hand work in tooth-carving. I agree with her in this sense because it makes one take more interest in and appreciate more thoroughly the individuality of the patient, causing one to carry more thoroughly in mind that individuality as an aid to an harmonious restoration. The manufacturer of teeth has departed largely from that. Many say that the manufactured tooth of to-day is a vast improvement over the hand-carved tooth. It is a vast improvement probably in a sense. We have more latitude in selection, but we do not take the work to heart as much as we did. It is not the fault of the manufacturer, but the fault of the practitioner, that a large majority of them have created the demand for purely artificial teeth; not a substitute for the natural organ, but artificial in its worst sense, the white, pearly, beautifully-shaped tooth. The majority of practitioners have created that demand, and I will say unhesitatingly that the greater number of our manufacturers of to-day do not make the artistic teeth that they manufactured even a few years ago. I have made for some years a specialty of prosthetic dentistry, and I find the greatest difficulty in obtaining teeth that are at all natural in regard to shade and shape; and I find so much difficulty that it has made me of late years almost detest this work that I once so much enjoyed.

There was another point in the essayist's paper which made me

think that she did not get all her instruction in a dental college. While I am associated with a college myself, I should expect such remarks to come from one who received some of her instruction in what might be termed the pure laboratory before entering college or later.

A great deal of the fault to which I referred may be laid to the practitioner, because so many have entirely neglected prosthetic dentistry. I do not agree with some of the gentlemen who have suggested that this work should be turned over to the prosthetic dentist in the fullest sense, but I do agree with them in part. Here is probably one of the places where we may learn something from our medical brethren. We do not specialize quite enough. Another defect is that we as practitioners of the art all the way through do not take up prosthetic dentistry as it should be taken up. I do not agree with the essayist, unless I have misunderstood her, in regard to work upon patients. I do not believe she means entirely upon patients. I think she means that the earlier training should be upon models, and as far as practicable instruct students in the college, going just as soon as possible from the model to the patient. The whole foundation—not of prosthetic dentistry, but of dentistry all the way through—I believe to be first teaching the mixing of plaster. Teach the student how to mix plaster, how to handle plaster, and you have very little difficulty in making a dentist out of him. If he does not learn that he of course does not learn how to make a model, and without the making of a proper model it is almost as ridiculous to attempt to accomplish anything as it would be to attempt to build a house without any plans.

However, I did not rise with the idea of discussing the paper, but simply to express my appreciation of it.

DR. CRAWFORD: I did not think I would say anything upon the subject, but the last speaker made a statement that was so intensely vicious in its moral effect that I must be permitted to say a word.

The great good resulting to dental surgery from the introduction of modern crown- and bridge-work has scarcely been appreciated, and it will perhaps be many years before the full force and benefit of it will be realized. The gentleman was so positive in his statement that I wanted to make an announcement or two. I did not get up to thank the essayist for her splendid paper or to engage in cajolery or anything of that kind, but to call attention to the point to which I refer.

Now, I wish to make a little contribution. Some who do not do mechanical work will perhaps not appreciate it, but I know there are a number here who will go home benefited if they will take the suggestion I make. In order to realize the full benefits of the suggestion I want to call your attention to something which depends entirely upon the introduction of modern crown- and bridge-work. First, I ask you what is the most favorable case for mechanical dentistry? It is that of an individual who has been so unfortunate as to lose all the teeth upon the upper jaw but to have a full set of natural teeth on the lower jaw. Every intelligent mechanical dentist will admit this. Now, take a characteristic, typical case that is to be found all over this country, the cases of individuals who have been unfortunate not only in losing all the teeth upon the upper jaw, but who have lost enough teeth upon the lower jaw to make the characteristic edentulous gap on each side. What does modern crown- and bridge-work do? It enables the dental surgeon to take hold of that case, and by the construction of proper fastenings on either side the edentulous spaces are filled and large grinding surfaces of porcelain molars are presented, and you have restored that patient from the deplorable condition in which he was to a first-rate condition for the application of an artificial denture.

Now, another thing about prosthetic dentistry, or prosthodontia, as you have it now. The dental societies change the names so often that it is difficult to tell what they do mean. Sometimes they call it "stomatology" and "dentology," and a lot of other names. I like substantial things, in language as well as in anything else. When we get a good thing I want to hold on to it. They used to call the different branches mechanical dentistry, operative dentistry, and regulating dentistry. I will tell you what is an instructive thing to do in mechanical dentistry: Go home and take some poor unfortunate man or woman who had the teeth pulled out fifteen or twenty years ago and who has worn a set of teeth inserted by some fellow who put them in and turned the patient loose. Take the plates out of the mouth, take correct impressions, make accurate models, and then put the teeth in and articulate them so that they will open and close as they should. Then sit down and compare the difference. It will show that we can do very much more in the articulation of the teeth than we used to think, and that

the forces of impact never cease to exert their effect upon the tissues while the life-blood passes through them. It is a great study to sit down in front of an old edentulous mouth, or the model of a mouth that has been unnecessarily deprived of the teeth, and see the wonderful changes that have taken place under the forces of impact. I am one of those who do not believe in divorcing or separating any of the parts of this grand system of ours. It is a beautiful structure, this thing that you call dental surgery, from one end of the line to the other, a grand prophylaxis in all its bearings.

I am glad that we have had this paper to-night, and I am glad that we have had this discussion. I am glad to see the interest that has been awakened. I am glad to hear this talk about the work that some of the fathers used to do. Let us do all we can to improve prosthetic dentistry, or prosthodontia, or mechanical dentistry, or whatever you call it. If I were to seek a subject upon which to draw the strongest indictment that was ever brought against mankind, I would go around and gather up specimens of all the work that has been put in the human mouth to masticate food upon and I would lay them in one pile and then I would commence. There would be a topic on which a man could make such another indictment as Thomas Jefferson did against King George of England a little over a hundred years ago. Think of the specimens of artificial dentures which have been put out in this country with the plaster still sticking on them, furnished to a long-suffering people at fifteen dollars a set. Think of the idea of a man undertaking to put together twenty-eight teeth—I believe twenty-eight make an artificial set—for fifteen dollars! Sometimes it surprises me to think how we sit still and let the public disgrace themselves. But how many men there are disgracing themselves and their country and doing the greatest injury to the high art that we practice by making ten- or fifteen-dollar sets of artificial teeth and pulling teeth for a quarter. I say, don't do it any more.

DR. GALLUP: In regard to what Dr. Butler said about articulation and occlusion, I had always understood and what I intended to bring out was that articulation is the swinging motion of the jaw, the act of closing the teeth, and I understood occlusion to be the teeth in repose.

DR. OTTOLENGUI: That is right.

DR. GALLUP: On the question of studying individual faces I have a very small collection of photographs of what I consider ideal faces, and I am making a study of them. Of course my work in that line is very limited, and my collection very incomplete at present.

I expected to be taken up on the subject of factory-made teeth. I very seldom use a set of teeth just as I get them from the depots, but perhaps take a central from one case, a lateral from another set, and a cuspid from still another, perhaps of different shades of color, and then grind them. I never put in a set of teeth just as I procure them from the depot. If the patient has retained a tooth that has been extracted I mold that in plaster and make my carved tooth from that, and get the type of tooth if I can. Of course, if the patient has any anterior teeth I try to get my type of teeth from them. If not I have to do the best I can.

In regard to student work, I meant the working directly on models, not having a patient; and I think if dental students were put to doing continuous-gum work they would not really know the proper lines on which to make a plate. They only do it as a purely mechanical thing. I do not know that I make myself entirely clear, but I have endeavored to do so. To the gentleman who said that he thought I obtained some of my instruction somewhere else than in a dental school, I wish to say that I did have a little outside of that.

SECTION I.—Continued.

A System of Removable Bridge-Work.

PAPER BY W. E. GRISWOLD, OF THE SECTION.

THIS is a method embracing the good features of the system now in use, with the addition of facilities of removal for repair and thorough cleansing. It also affords the opportunity for restoration of contour of the soft tissues, and thereby producing more natural and artistic effects. The excessive display of gold is also obviated.

For five years I have been experimenting with appliances and combinations of metals which would hold saddle plates when in place with the necessary degree of strength and immobility, and yet have these appliances easy of removal and with the ability to tighten the fastening should it in use become loosened.

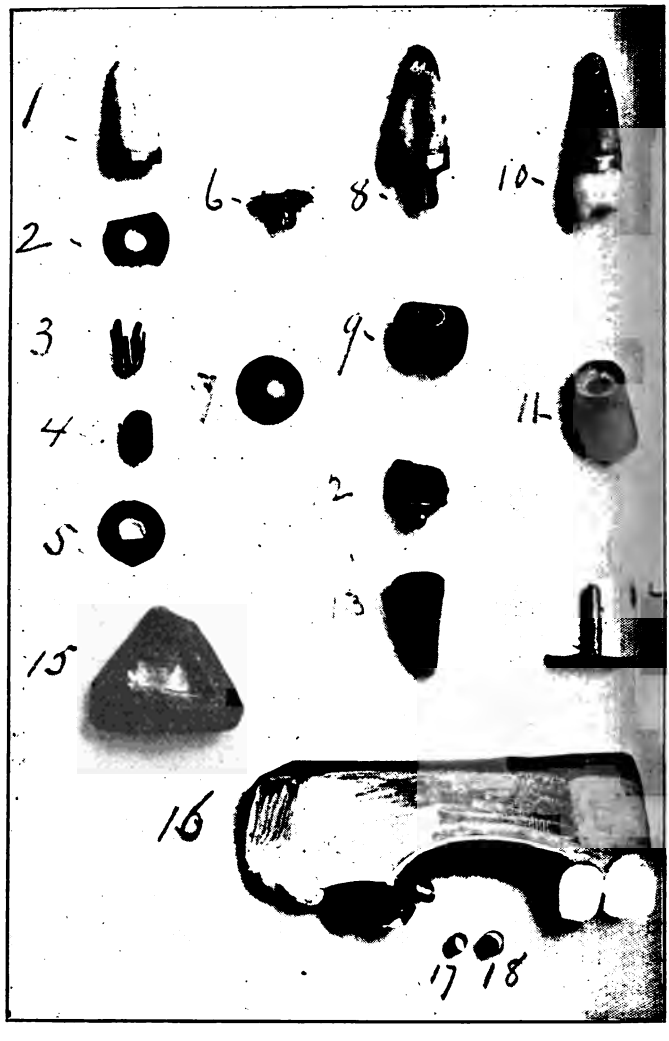
I have at last succeeded by making a crown which is held by a spring stud, and to which a saddle carrying other teeth can be attached.

The appliances are represented by Fig. 1. No. 1 represents a root capped in the usual way, with a band around it and a pin in the root. (These can be made without bands if desired.) No. 2 is a reducing ring. No. 3, the spring stud. No. 4, platinum cap. No. 5, tooth base-plate.

In assembling these parts an impression is taken in plaster of the capped roots (these caps must slip off from the roots easily) and the parts to be supplied with teeth. The inside and pins of the root-caps are covered with a solution of paraffin dissolved in ether, the impression varnished, and a model made. After the model is made it is slightly warmed, so that the root caps can easily be removed and replaced accurately.

This model is waxed on the instrument represented in Fig. 2. This instrument is adjustable in all its parts, and is used to set the

FIG. 1.



spring studs perfectly parallel one with the other. The cap 4 is placed in its holder E, Fig. 2, and the spring stud slipped inside

it; and, if the small size is used, the second size cap fits inside the first, so they can all be telescoped together, and the one holder D,

FIG. 2.

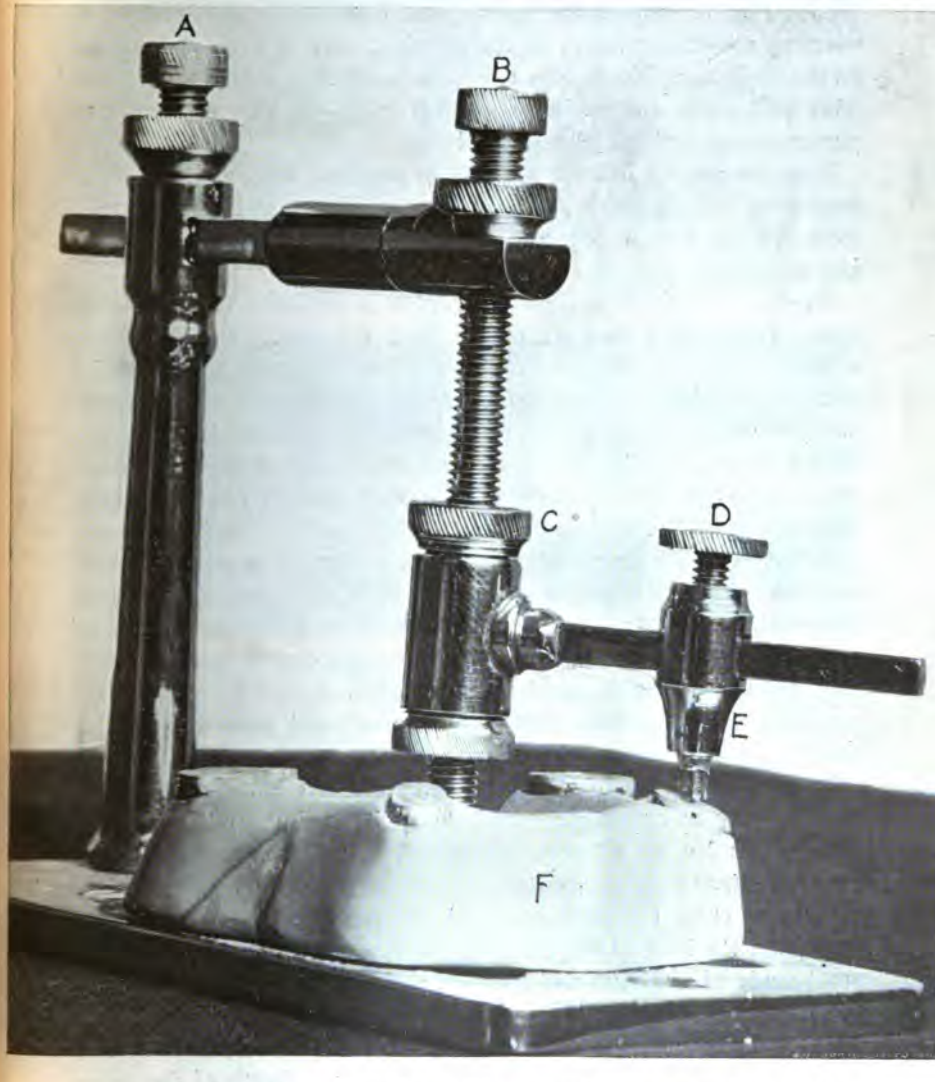


Fig. 2, is used for both sides. They are brought to the position they are intended to occupy on the root cap, as at E, Fig. 2, and

the angle observed to which they are to be ground or filed. With the holder D they are removed and cut to the proper angle, both cap and spring at the same time, taking off and replacing until this result is obtained accurately. Then we take the reducing ring No. 2, Fig. 1; remove the spring stud from the holder, and by a twisting movement insert in the opening, turn it over and solder on the back, as at No. 6, Fig. 1, which shows Nos. 2 and 3 together. This will make the spring stud just as much shorter than the platinum cap as the thickness of No. 2.

Now we replace in holder, carry to position, and wax fast with hard wax. We then remove root cap and Nos. 2 and 3, and invest as at No. 15, Fig. 1, showing the root band exposed on one side, and all parts in position.

As No. 2 projects beyond the cap, it is soldered from the cap side. This is then filed up, so that Nos. 1, 2, and 3 are one piece, as shown in No. 8. It is important that the foregoing be accurately and securely done, as these parts remain permanently on the roots in the mouth. We proceed in the same way with each abutment. This finished, we take No. 4, which has been cut at the same time and same angle as the spring stud 3, and place it over the parts represented in No. 8; then No. 5, and slip over it. As these are all punched to a uniform gauge, they fit each other accurately. Fasten together with wax; remove and solder with pure gold or gold and platinum. We then have the crown plate 5 and cap for spring stud, as at No. 7. From this on the crown can be made in any way desired,—all gold, gold with porcelain face, all porcelain, or porcelain with platinum occluding surface; and governed by the length of tooth, position in the mouth, etc.

In No. 8 we have 1, 2, and 3 assembled. At No. 9 a porcelain crown, with its base-plate 5 and cap 4 for spring stud inside the crown. At No. 10, all parts assembled. At No. 11 a crown, with supplementary band encircling root cap for greater strength. Nos. 12 and 13 show the parts reversed, the cap 4 in the root and the spring on the base of the crown for very short teeth. No. 14 is a stool made of platinum and iridium, with hollow post fitting cap 4 for holding it while building it up with porcelain and firing. No. 15, a case where the posterior attachment consists of a platinum and iridium solid stud soldered on a gold crown; a sheath of the same metal slipping over it and soldered to the saddle, the anterior end supported by one of my removable crowns.

In making a bridge we replace all the parts represented at 8 in the mouth without cementing to the roots, but they are expected to fit so accurately that friction will hold them with considerable firmness. We then take our previously prepared saddle and put it in position; then take parts, as at No. 7, and slip over the spring stud. As No. 5 is larger than the root, it holds the saddle in place. Now we take our bite or articulation.

An essential feature now comes into play; that is, the taking of the final impression under pressure. To accomplish this I use a prop, which can be made longer or shorter by unscrewing or the reverse, with a cushion of rubber at one end and a yoke at the other. This is placed in a hole in the bottom of the impression cup, working easily up and down, shown in Fig. 3. We use three-minute

FIG. 3.

plaster, which gives time to adjust in the mouth. Place in position, with the yokes pressing against the saddle and the rubber on occluding teeth; have the patient bite with considerable force; see that all parts are in correct relation to each other, then force up the tray containing the plaster. You thus get an impression, with the saddle forced against the soft tissues, with all the force which will subsequently be used in mastication. Remove the impression, pull out the root cap and spring stud, which will generally come with the impression; lay aside until work is completed; run a model, which will show the saddles and caps in proper place; solder thereon all together; then put on teeth with vulcanite; make continuous gum or solder, as desired. When the bridge is complete cement the root caps carrying the spring, as at No. 8, Fig. 1, to their respective roots. When the cement is thoroughly hardened put the bridge in

place. If the retaining spring should ever get loose, it can always be tightened by a very slight tap on the end.

In this combination we have the ideal in prosthetic work. Restoration of contour of soft tissues; exaggeration, if necessary, to give a pleasing expression to the face; rigidity when in place; easy removal for cleansing and repair; and, in the hands of skilled men, it would seem to me to make a valuable addition to the armamentarium of the prosthetic dentist.

There being two sizes of these appliances, one telescoping the other, the ingenious operator will combine them to suit the conditions. A case might arise where the tooth to be attached was so small that it would necessitate placing part of the appliance in the root and part in the crown. This can be done by cutting off the end of one of the caps, fastening the spring to the right sized reducing ring, and soldering to the cut-off end of the cap. Then we take an iridio-platinum wire and fit it in the hole, letting it extend down into the spring nearly to its end, and as long as the root-canal will allow, and solder. Then we take the right sized crown cap and solder on the root end, and adapt it to the end of the root. We now take the smaller size cap, carry it over the spring inside the larger cap, and put its crown plate on to correct position, wax, remove, and solder. We thus get an attachment, half in the root and half in the crown. For saving metal I have had hand punches made for punching the different sizes of washers.

SECTION I.—Continued.

Ideal Crown- and Bridge-Work.

PAPER BY NELSON T. SHIELDS, OF THE SECTION.

NO branch of prosthetic dentistry has caused the profession so much anxiety, and no branch has reaped such a harvest of dissatisfaction as crown- and bridge-work. Cleanliness, artistic beauty, and strength are the three essential obstacles to scientifically overcome in the anatomical substitution of an artificial crown for a natural crown. The presence of gold is unnatural, but we have been compelled to use it for strength. Frequently we have a great deal of trouble in selecting a tooth the exact color of the natural teeth, and after this is accomplished the color will be changed as soon as the tooth is backed with either gold or platinum; and just as great as this change is, just that much the natural or artistic beauty is lost. This backing must come to the cutting or grinding surface or else the facing is liable to break off, on account of having nothing to hold the unprotected cutting or grinding surface.

Plain plate teeth with vertical pins are much stronger than teeth with cross-pins, because the cutting or grinding surface is better protected with this arrangement of the pins. The saddleback tooth makes a beautiful crown, but the porcelain has not sufficient hold on the pins to resist a strong jaw, particularly when used for superior bicuspids and molars.

Dr. George F. Jernigan and myself have overcome these difficulties, and we take pleasure in giving the profession the benefit of our improvement in the manufacture of teeth for crown- and bridge-work. Instead of teeth being manufactured with cross-pins

or vertical pins, they should be made with a platinum backing and a keel or rib extending from the cutting or grinding surface through the entire body of the tooth, projecting through the cervical end of the tooth. This keel or rib has a hole extending longitudinally for incisors and cuspids, through which the porcelain is packed; it also has a toe extending to the cutting or grinding surface which does not project through. This toe is curved on the palatal side, which permits the porcelain to be packed under it. The porcelain and toe afford great strength for the cutting surface without the necessity of being protected by the backing, therefore there is no need for extending the backing to the cutting-edge of the superior and inferior incisors and cuspids. When the porcelain is baked through and around this keel or rib and on the platinum backing, we have a tooth that cannot be bitten off; we have a tooth with a translucent cutting-edge; we have a tooth already backed in the best possible manner. This tooth, when ground to fit the foundation, can be soldered to the foundation with ease, and the solder will follow the keel or rib that extends through the porcelain at the cervical end of the tooth, which gives great strength.

In order to have a perfect cervical margin, a piece of pure gold, of the thickness of No. 34 American gauge, can be soldered at the cervical end of the backing and burnished over the cervical portion of the tooth. Place the tooth upon its foundation; box it in with pure gold on its approximal sides and around its cervical margin; then invest and solder, and a perfect crown in every particular will be the result. We can extend the backing to the cutting- or grinding-edge of incisors and cuspids, but in our experience, even with low-fusing porcelain, we have not found it necessary, and we would have been deprived of the translucency.

Saddleback bicuspids and molars should be manufactured with the entire palatal portion covered with a platinum backing, with a deep keel or rib projecting very near the buccal cusp, with a large hole through the keel or rib. Where the bite is very close, as we frequently find it in constructing bicuspids and molars, regular facings can be used with the backing extending over the entire palatal surface of the facing to the very edge of the grinding surface. The facing will not require any protection at the buccal grinding surface on account of the keel or rib, and consequently no gold will be visible.

A tooth selected with this backing and keel or rib has no possibility of changing color on account of adjusting a backing, the backing and keel or rib and tooth having been solidly joined together in one coherent mass. The substitution of artificial crowns for lost natural crowns based upon these scientific lines from beginning to finish is ideal.

DISCUSSION.

DR. CRAWFORD: I should like to ask Dr. Shields one question. He says he has made a crown with a porcelain surface, representing as nearly as possible the natural crown, and one that practically could not be broken off. That is the cardinal point in the paper. If he has accomplished this he is entitled to our consideration. I shall hear with a great deal of satisfaction the realization of this definite statement that it cannot be broken off. I should like to have the gentleman give us the physical principles involved,—the mechanics of the thing that warrants that statement.

THE PRESIDENT: We should be glad to hear a discussion of this paper of Dr. Shields's. If there is no disposition to discuss it, I should be glad to have Dr. Shields answer Dr. Crawford, and say anything that he may wish to say in elaboration of his paper.

DR. SHIELDS: The paper simply treats of facts alone. We all know the difficulty of breaking off a Logan crown below the pin, and the cusp of the Logan crown has no protection whatever with platinum. This crown is made with a backing which will cover the entire back of the tooth, of all teeth posterior to the cuspids, clear down to the very cutting surface. In teeth anterior to the cuspids, —that is, including incisors and cuspids,—there is no necessity for protecting the back entirely to the cutting-edge, from the fact that we have a rib which runs longitudinally through the tooth from the cutting-edge through the cervical margin. During the manufacture of a tooth the porcelain is packed through the central hole in the rib, making almost a homogeneous mass with the backing and rib and the porcelain. It is certainly one coherent mass, the high-grade porcelain adheres so tenaciously to the platinum. At the cutting-edge of the six anterior teeth, superior and inferior, the porcelain is capable of being packed beneath the curvature that we have in the end of the toe, which makes it absolutely impossible, except by the use of a hammer or some severe mechanical means, to remove

it; and in these teeth that I speak of, by having no backing coming to the extreme cutting-edge, we get a beautiful translucency that we have never been able to have before in crown-work without the liability of breaking off. You can produce the same effect by using porcelain instead of gold, but the low-fusing porcelain has a great tendency to discolor in the mouth. Here, with the high-fusing porcelain, that is not the case. Here we have a tooth that is already backed in the best possible way, the teeth being baked onto the backing. In bicuspids and molars the backing comes entirely to the cutting-edge, and it also has this toe protecting the cutting-edge. Therefore, there is no gold visible at all. In the facing we permit the gold to come to the extreme cutting-edge. In cases where you can use a saddleback tooth, you have the grinding surface and the whole buccal surface of porcelain. The saddleback tooth that is made to-day has two pins which certainly do not extend more than a quarter of the distance into the tooth; but if the saddleback tooth is manufactured with the entire back covered with platinum, and a deep keel projecting almost to the extreme buccal cusp, and a large hole through the center of it, you can all understand how this porcelain, being baked into the central hole, makes an almost homogeneous mass between the porcelain and the platinum. It gives a tooth that can be made in the most artistic manner, having nothing but the porcelain visible; and a tooth that you cannot possibly break off, because the whole tooth is baked onto the platinum backing and fastened with this deep keel, with a hole projecting through it. Therefore, if a crown that is manufactured on the poor lines of mechanism that the Logan crown is manufactured on cannot be bitten off, how can you break off a tooth with a keel projecting almost to the buccal edge? That is the reason I say that this tooth cannot be bitten off, because it is made upon purely scientific lines. Not only that, but the teeth which we make at the present time are a very poor representation of this paper. They are made with cross-pins, with a deep slot cut in the center of the tooth between the cross-pins. We make this backing and keel or rib and put it in with a high-fusing porcelain, with the rest of the tooth all made, and even with the teeth already manufactured and the keel put in in this imperfect manner, we have never had a bad result; and you cannot even break that tooth off. And where the high-fusing porcelain tooth is used, that is all the more reason for rendering it impossible.

DR. AMES: It seems to me you ought to bring out the fact that the backing and keel are of one piece of metal.

DR. SHIELDS: The backing and keel are preferably made of one piece of metal; a plain piece of sheet metal folded in the center, the wings spread over the palatal surface of the tooth. The keel of the palatal backing and the little lug are all one piece of platinum. The object of this lug is that when the tooth is manufactured it holds the platinum firmly in the mold; and also when you want to make a perfect cervical margin, you can take a piece of pure gold and burnish it to the cervical margin, making an absolutely perfect joint where usually there is a little, infinitesimal defect. I have models explanatory of all this, and of the different stages of making the tooth from the time it starts until it is finished. It will afford me great satisfaction to show them to you.

DR. AMES: Do you depend for the strength of this keel on the fact that the solder runs between those two layers, as it is doubled upon itself?

DR. SHIELDS: No; they are welded together. But the solder does run over the entire backing, and it runs onto the keel that projects through the cervical margin. I should like to state, in regard to removable bridge-work, that the places where it is most applicable are where the abutments are too loose to fasten bridges permanently. The great object in using the removable bridge is to spare the abutment from mutilation. The paper of Dr. Griswold states that he removes the crown of the tooth entirely. The crown being entirely removed, there is no object in having a removable bridge. If you are going to remove the crown, why not put it on to stay? The natural answer would be that you could not keep the bridge clean on the palatal side. That is a mistake; if the palatal portion of the bridge is constructed on curved lines, it can be cleaned readily. Dr. Griswold presented a typical case last night, with the whole upper jaw restored, on two eye-teeth and two second molars. He made that bridge removable. There is no object in having it removable, and it would be a great blessing if it was permanent. Where a removable bridge is made on the plan of Dr. Bonwill's removable bridge, where it is made with a stay on the grinding surface and a clamp on the approximal surface, you have a removable bridge made on appropriate lines, because there is no mutilation of the teeth whatsoever. I am antagonistic to the ideas presented in

the paper, from the fact that the whole of the crown is removed in the construction of the removable bridge.

DR. GOSLEE: I have for some considerable time been very much interested in the subject of removable bridge-work. I do not practice it as extensively, however, as it might probably be indicated, because we have not had as yet, in my opinion, a good, secure method of anchorage, that possesses sufficient strength. When Dr. Shields referred to the mutilation of the abutment root for removable bridge-work, the thought occurred to me that I must oppose him, because where removable work is mostly indicated is in extensive cases; and in these cases we are always perfectly justified in the mutilation of the teeth that are to serve as abutments if necessary to insure strength and permanence. I do not believe that removable bridge-work of this nature is indicated at all in short or small bridges, and in such instances I should preferably always put in stationary work. But not being a firm believer in extensive stationary work, I am always anxious to find some means of sustaining a removable bridge; and believe that Dr. Griswold's method presents ideas which are the best that I have as yet seen, because they will certainly anchor it securely. The criticism that I would make, however, of Dr. Griswold's method, which, as you know, is simply a modification of the glove attachment, is that it is not, as now constructed, strong enough to withstand the force of mastication. There is no question of that. No matter of what metal that little spur be constructed, as it is now it cannot possess sufficient strength to withstand for any time mastication in all lateral directions. If the doctor were to make that little spur with fewer prongs and have them larger, so that they might be stronger, I believe the principle itself would be all right. I do not hesitate in most instances to sacrifice, if you please, the crowns of teeth that are to serve as abutments, because wherever a permanent bridge is indicated at all we are usually perfectly justified in sacrificing the crowns of the teeth that will carry that bridge. For all short spans of two, three, or four teeth we are or may be justified in stationary bridge-work, but where we have a span of greater length than that it is not always desirable, and I do not believe it is the best thing at all times. In such instances we must have some means of securely anchoring a removable bridge, and I believe, as I said before, that the principle advocated by Dr. Griswold is built upon stronger lines than any

other that I have yet seen. This principle is similar to the split post and tube that has been used so successfully for a long time, and my only criticism is that it is not strong enough as now constructed.

DR. SHIELDS: I want to know why you do not approve of stationary bridge-work in cases where the bridge is extensive.

DR. GOSLEE: There is a principle in bridge-work, as there is in any line of mechanics, that one or two teeth will not do for any great length of time a great deal more work than was originally intended for them. Two men cannot do more than the work of two men, and you could not well expect two teeth to do the work of six or eight for any great length of time. For that reason I do not believe in anchoring an extensive bridge, where there is a span of four, five, or more intermediate teeth, to two abutments, because in such an instance we should be expecting of those two abutments the work of six or eight teeth, which would not be the case if that were removable. There would be a support upon the tissues here which would relieve the abutments some, and it could be taken out at times to give them complete rest. In such instances, certainly, a removable bridge would be easier upon the abutments than a stationary one.

DR. GRISWOLD: This is simply an idea worked out and systematized to meet a demand in my practice; a demand for something in bridge-work which is removable by the patient for cleansing, and also makes possible the restoration, or exaggeration if necessary, of the soft tissues (changed by absorption of the process) to their normal contour, and thus giving harmonious expression to the face. By this system you combine plate- and bridge-work, and get all the benefits of both, with the addition of the ability to remove and rest the parts to which it is attached. I have some cases in use, and find the spring attachment more than strong enough to hold them firmly. As to the lateral pressure, it does not come on the spring entirely; the close fit between my crown-cap and root-cap, and the fact that it is a flat connection with the labial and lingual adaptation of the saddle to the soft parts, takes most of the strain laterally.

DR. F. N. BROWN: I have in the past taken quite an interest in crown- and bridge-work, and in looking over the cases presented by Dr. Griswold, showing his contrivance for removable bridges, the idea occurred to me that it would be the ideal attachment for porcelain bridges of considerable length, and especially for full continu-

ous-gum sets without palatal surface, such as Dr. Griswold presented last night in vulcanite. The practice heretofore has been to use gutta-percha or chloro-percha in connection with cement for the permanent retention of such extensive porcelain bridges or continuous cases. This fixture would allow of ready removal of the piece in case of accident or need of repairs.

One other point would be worthy of attention in the use of this attachment: All his plates and bridges are removable and made with saddles, which tend to relieve the columns of support of considerable stress, and, being removable, the saddles are readily kept clean. I believe, with this removable attachment and saddle, we would be justified in introducing bridges or plates more extensive than a single tooth or dummy beyond the points of support or attachment, which is now the accepted rule.

DR. AMES: I supposed the discussion was closed by Dr. Griswold. If it is not, I should like to ask Dr. Griswold what he calls that apparatus by which he gets the tubes arranged in parallel.

DR. GRISWOLD: I have no name for it. I got it up as a means to an end.

DR. AMES: Whatever the apparatus is named, to me this was the most satisfactory part. It was the part that appealed to me unquestionably. I have speculated in my mind for years on some apparatus to accomplish just this, not so much to get something to arrange the different parts in parallel on the model, but in the mouth itself; and what I would criticize in the work presented here would be that I would prefer to have the tubes within the root and the other apparatus upon the plate, just the reverse of Dr. Griswold's arrangement. In many cases, I fear the bite would be too short.

DR. GRISWOLD: You can have them as I have shown them here, or *vice versa.*

DR. CROUSE: I wish to describe a removable bridge seen recently that seems to be a success. In this case the bridge and the abutments were all removed. It had at one time been a quite extensive permanent bridge, with three attachments; and the patient came to me, taking it in and out, sticking the teeth back into their sockets and wearing the bridge. I speak of that because it seems new. I have several bridges in my possession that have been removed, but they have not been put back into the mouth. This is the only instance of the kind that I have seen.

SECTION I.—Continued.

The Mechanical Fixation of Teeth Loosened by Disease.

PAPER BY FRANK G. GREGORY, OF THE SECTION.

FREQUENTLY there is presented to every dental practitioner a class of patients who, for years perhaps, have been troubled with teeth so loose and diseased that it would seem almost useless to attempt anything in the hope of retaining them and restoring the teeth to usefulness. Any resort resulting in a favorable solution of this difficulty always gives the operator a sense of satisfaction, and the patient renewed confidence in the dental profession. Recognizing the value of retaining teeth in a position somewhat suggesting the natural stability of the individual tooth, thereby reducing the susceptibility to inflammation, many commendable devices have been introduced prolonging the usefulness of greatly impaired teeth, restoring the masticating function for a greater or less time. There is objection to some of the devices because of the amount of time, labor, or skill required to produce a satisfactory appliance. Then, too, the great display of gold is so serious a disfigurement as to render it inapplicable. In determining the proper appliance that shall serve, many things must of necessity be taken into consideration: among them the utility of the piece, the esthetic and prophylactic prognosis; and there should also be an opportunity for an easy access to the tissues, allowing such treatment as is required to keep the parts under a favorable influence. These seem to me the most vital.

In the hope of meeting these demands, a fixture to be described

seems devoid of many objectionable features, and commends itself for its simplicity of construction and ready adaptation to the various conditions presenting in either the upper or lower jaw. A case not so commonly encountered, but involving the many difficulties likely to be introduced, will serve to illustrate the *modus operandi.* An upper denture, teeth exceedingly prominent, the incisor teeth, especially the centrals, very loose, and the temptation to extract strengthening as we study the case; but ten of the teeth remain, and these articulate imperfectly with the lower ones, bringing undue stress upon the weakened incisors, preventing the proper mastication of food. After having the irritation reduced and the discharge of pus greatly lessened, the teeth were ligated so as to articulate to the best possible advantage. An impression was taken carefully, and the patient dismissed for the time being. Disks of pure platinum were burnished to the palatal surfaces of the incisors, extending from the cutting-edge slightly under the free margin of the gum and about one-third the antero-posterior thickness of the tooth. A gold crown was fitted to the first molar on each side, dummy bicuspids added, half-round clasp wire (gauge 14) shaped to conform to the palatal surfaces of the six anterior teeth, and connected with the disks and crowns, using sufficient solder to make the piece rigid, but with a springy quality. Before removing the piece from the cast, the position of the pins to retain the fixture was noted and holes drilled. The piece was then placed in position, cementing the crowns and disks, and the incisor teeth were ligated temporarily while the setting of the oxyphosphate took place. This accomplished, holes were drilled into the teeth at the points where the disks were perforated; two holes in teeth having living pulps, and three holes where the pulps had been removed. These holes were made at obtuse angles, in order to gain strength and prevent the parts from working loose. After countersinking the hole in the metal, the tooth was tapped to receive a headed platinum pin carefully threaded. After making a groove in the head of the pin, some thin oxyphosphate was introduced into each hole prior to driving the screw home. After many months of use, the patient frequently reporting for inspection, the results accomplished are certainly encouraging.

There is every reason to believe a most successful issue can be derived from even the most hopeless cases, and where conditions

are more favorable very gratifying results can be obtained. With such a device there is no foreign substance exposed to view, the enunciation is not interfered with, the articulation is greatly improved, and those peculiar characteristics giving personality and distinctiveness to the individual are not only preserved, but very greatly enhanced.

SECTION I.—Continued.

Mechanics as Related to Dentistry.

PAPER BY W. STORER HOW, OF THE SECTION.

WORD meanings change or vary through customary and incidental usages. Therefore, the thoughtful speaker or writer of to-day has not only to judiciously select suitable words for his purpose, but may well be carefully definite in attaching to certain phases of words the precise significance they are now designed to impart.

From several pages of dictionary definitions some citations regarding the present subject of mechanics as related to dentistry follow, and for convenience of reference they are indicated by marginal letters in parentheses:

The word mechanic, as an adjective, has:

(A) 1, A broad significance, "As in the phrase the mechanic arts."

(B) 2, "Supporting the materialistic view of the universe, atomistic."

(C) 3 "(Obsolete), like or pertaining to a mechanic, hence common, vulgar, mean."

As a noun mechanic means:

(D) 1, "One skilled in the mechanic arts, or exercising a mechanical employment; one who has the art of using tools or instruments; a handicraftsman; an artisan."

(E) 2, "One who works as though he were a machine, by force of habit and without intelligence; used contemptuously."

(F) 3, "A workman whose occupation consists in the systematic manipulation and constructive shaping or application of materials."

(G) "To many persons whose business is partly mechanical the term is inapplicable, as farmers, surgeons, and artists."

The noun mechanics has a very wide purport, including:

(H) 1, "The theory of machines. This is the old meaning of the word, especially before the development of the modern doctrine of force."

(I) 2, "The mathematical doctrine of the motions and tendencies to motion of particles and systems under the influence of forces and restraints."

(J) "The fundamental principles of mechanics are stated under energy and force, but the science is characterized by the great number of derived principles made use of."

With reference to the definitions under the head of (C), it is devoutly to be wished that the meanings "common," "vulgar," "mean" could fairly be deemed "obsolete" as applicable to any number of so-called dentists of to-day, but, alas! the sort is not yet archaic. Of course, they are not members of this Association.

Recurring to the definition (D), it may be said at the outset that the mechanical property of gentleness is a prerequisite for the dentist who is to manifest the ideal force of gentlemanly character in his honorable and useful calling. He should certainly be "one skilled in the mechanic arts," since they may in great measure be made tributary to the practice of dentistry, for he is (F) "a workman whose occupation consists in the systematic manipulation and constructive shaping or application of materials" in great variety and of manifold characteristics. He surely should not be a person of the kind indicated by the (E) designation as "one who works as though he were a machine, by force of habit and without intelligence." Far otherwise; readiness of resource and a quick adaptation of mechanical means to the exigencies of the ever-varying conditions of the presenting patient, distinguish and discriminate the alert and true from the merely perfunctory practitioner.

In the earlier periods of dental art there were but few mechanical aids prepared and provided for the equipment of a dental office and laboratory, but to-day the multitudinous means in great variety are scheduled and described in voluminous illustrated books and catalogues. An intelligent comprehension of their construction, char-

acter, functions, and uses presupposes actual knowledge of the involved principles of mechanics by those who are to operate the mechanical means provided.

For instance, take into consideration a dental engine, the operation and care of which is predicated upon fair attainments in practical mechanics on the part of the dentist. The presumption is a reasonable one, and the illustrations and descriptions, often accompanied by sectional views of important parts, should enable one fairly versed in mechanics to understand the organization and working functions of the engine, as also the need and means for keeping the machine in good order for service.

If the engine is to be actuated by an electric motor, a yet further acquaintance with the principles and performances of batteries, dynamos, rheostats, and other electrical apparatus is necessary.

The operative manipulation of an engine drill or bur in work upon a tooth in the mouth, or on a tooth-crown in the hand, brings the laboratory into such close conjunction with the office as to somewhat confuse and confound those who have sought to invidiously discriminate between mechanical and operative dentistry, but the modern term *prosthesis* effects a solution of the question on a working basis.

The radical meaning of prosthesis is "a putting to, an addition," and the special significance is "the addition of an artificial part to supply a defect of the body."

Dental prosthesis is therefore an appropriate and measurably inclusive designation of the mechanic art and science of dentistry. The subject of dental art and operations is the defective living human body, and especially that crowning part of it which is the mouth-piece of the mind of man. Surely the addition of an artificial part to supply a defect of the body at the inlet to its organs of subsistence and at the outlet of its mental products, is an occupation of highly estimable worth, honor, and dignity.

Man, as embodied mechanics, is, from a merely material point of view, the most wonderful operative organization within our knowledge. But more marvelous still is the fact that, under inspiration, man himself has thought himself out, and deduced the principles of energy and force; defining with precision the rules of the phenomena of motion, and following out with intellectual power and subtlety the consequences of those rules as certainly ordered by the

Supreme Ruler, and as constituting what may be termed the science of pure mechanics.

Microcosmic man, then, is the embodiment of volitional mechanics, the dental or stomatological defects of whom are to be supplied or corrected by the dental prosthetist, who is indeed a specialist in head and hand work.

What mechanical marvels are the organs of speech!

One not seldom hears it said that actions speak louder than words, whereas in truth a word is the highest type of action,—God spake and it was done. And the Word became flesh, and dwelt among us,—full of grace and truth.

Consider the fact that at this moment of authorship words in process of mechanical mentation and manual transference take form on this sheet of paper, and (D. V.) will be spoken in the presence of a number of other persons. In that event the successive differentiated waves of sound will enter the ears of every hearer, and, however numerous the auditors, each will receive the meaning with which the thought-cells are being freighted and transcribed for resurrection, revival, and reincarnation at the summer seaside not many days hence, or by the reader in years to come.

Let this marvel make clear the mechanical idea that intelligibly uttered or printed words are the peculiar products of a person. Furthermore, gain a distinct conception that an orderly and systematic arrangement of words descriptive of a mode of motion, or action in accordance with a rule or law, is in no proper sense a motor, but is simply the result of the act of a moving person. A rule or law cannot initiate action, and never of itself does anything in a motive sense.

Therefore, reverting to definitions (A), (B), (I), and (J), it should be evident that schemes and systems of thought based on a theory of the spontaneous movement of matter are absurd and fallacious from the view-point of the true mechanic, who, on seeing, or feeling, or learning of anything in motion, is logically certain that an Omnipotent Person originated the transmitted movement.

In the beginning was the Word, and the Word was with God, and the Word was God.

The word mechanics may thus by the devout dentist be seen to have a wonderful sweep of personal significance ranging from the atom to the universe, and arousing a feeling of humble awe, as in

the presence of the Creator of all that is, in Whom we live and move and have our being.

The dentist ought to be directly interested in every department of study and investigation relating to the mechanics of man, and hence he is properly concerned with physics, philosophy, anatomy, physiology, etiology, biology, histology, chemistry, therapeutics, pharmacy, and whatever manifestation of motivity may relate to man's dental organs in normal or abnormal conditions or circumstances, either immediate or remote.

This is a wide and comprehensive survey of physical relationship as tributary to the practice of dentistry, and under the constraint of brevity omits details; but the mechanic requirements of dental work in a large sphere of occupation will give employment to the trained faculties incident to a knowledge of every applicable manifestation of mechanics.

There is a still broader scope to the subject, involving what may be termed mental and moral mechanics.

The peculiar personality of man, wherein he manifests conscious power to conceive and to choose things morally good or bad, is a consideration lamentably lacking in either long or short current treatises or articles involving questions of fundamental philosophy; and the most designedly deceptive and delusive conclusions flow from this elimination of personality, and the substitution of an impersonal thing as possessing motive power.

Think of the weary weakness of an attempt to construct a scheme of general philosophy on the basis of vitality and personality imputed to a list of assorted sequences. As well attribute to the pen the making of buildings, bridges, books, laws, and everything else made on the lines formed by the pen in the hand of man. The work in any case is due not to the pen, the list, or the law, but to the person who does what he lists.

Passing from the stupidly fallacious premise of so-termed natural laws formulated and designed to destroy the fundamental faith of man in God as the personal Creator and Maintainer of all that is, we may now consider some of the details, which, as including merely recorded observations, we may view apart from the imaginings of the several sophistically scientific observers.

It will be well first to notice the present limitations of the modern observer, whose structural means of observation have been won-

derfully widened by artificial aids, of which the improved telescope, microscope, and spectroscope are extraordinary examples; illustrating first the purposeful power of persevering persons, and secondly the immensity, minuteness, perfection, and wisdom displayed in the wonderful works of the Omnipotent One.

With regard to life, the microscope is the observer's chief aid, and, in comparison with the scope of unaided vision, the field of microscopic definition is now many thousand-fold more; but the progressive widening of that field since the first lens was made implies the probability that in days to come the field may be wonderfully wider, and disclose objects still invisible to man.

Yet with that history in full view, and the minutiæ of life-forms still out of sight, there have been observers who have hastened to base upon assumptions of the unknown particulars a scientific (?) system designed to displace the idea of a personal Providence, and to substitute the idea of a presumptively initial and continuously potent particle as the progenitor and preserver of life on the earth.

One writer has said, "We see in a single microscopic cell the potentiality of every form of living being, needing only time and space to realize its possibilities." "Surely, then, if a single, simple organic cell shall, in the course of a few days, months, or years, result in the production of a moss, an oak, a worm, a fish, or a man, there certainly can be no improbability that a like cell, in the course of untold ages, may have been the ancestor of all existing forms of living beings." (Leidy.)

Could there well be a more surprising example of the *reductio ad absurdum?* Indeed there can, for here is another scientist (?) who suggests that a mere machine made only of non-living matter might improve upon itself.

"Are not improved steam engines or clocks the lineal descendants of some existing steam engine or clock?

"Is there ever a new creation in art or science any more than in nature?"—(A. R. Wallace, "Natural Selection," page 295.)

"By an intellectual necessity I cross the boundary of the experimental evidence and discover in that matter which we, in our ignorance of its latent powers, and notwithstanding our professed reverence for its Creator, have hitherto covered with opprobrium, the promise and potency of all terrestrial life."—(Tyndall, "Belfast Address 1874," page 75.)

A like frank confession is due from the other claim-everything scientists who by an intellectual necessity of ignorance rush in across the boundary of experimental evidence and hold strange scientific seances, whereat the promises and potencies said to have been discerned never materialize; yet on that very unverifiable agnostic basis it is attempted to build the "now accepted hypothesis of evolution."

Is it not asking too much of a thoughtful theistic man to for a moment imagine it possible that a mote needs only time and space to "transform" itself into a man?

These marvelous perversions of reason and their adoption and advocacy by many whose minds are clear and strong in their grasp of the verifiable details of cognate subjects, seem inexplicable on any other ground than that of a designedly wrong motive. Their predecessors who declared their demonstration of spontaneous generation had reason on their side until their "verified" demonstrations were proven defective and false. Every one of the "bathybius" sort of scientists must at the last confess that, like the spontaneous generationists, the wish induced the thought; but, now that there is no going behind the fact of invariable biogenesis, or life always from antecedent life, let us notice some of the fundamental manifestations of life. A being maintains its existence by appropriating nutriment which it selects from contiguous materials, and this faculty of natural selection is an essential, and therefore primary, function of being. The word being is here used as expressive of actual life, inclusive of every self-moving thing, either organized or "structureless," as our pseudo-scientists term being the minute perfections of which have not yet been discerned, but which, at the boundary of present vision, might be reasonably inferred were it not for the "intellectual necessities" of observers having an atheistic or agnostic "working hypothesis" to be maintained.

Repeated selections of foods by beings under conditions not uniform, result in varieties of shape and size within the structurally selective limitations of those beings, of which there are, therefore, probably never two precisely alike. Yet there are beings so nearly similar in structural character that for convenience of identification and description they have been grouped in classes, which include such as repeatedly resemble each other as the result of selective

reproduction within the definite limits of structural characteristics. Moreover, these observed limits have been so notably defined, while yet the intricacies of structures have been so marvelously multiplied, that as a rule the reproductions have occurred within those limits. The time-limits of existences have also been definite, but variable within those limits, which nave been furthermore changeable while yet distinctive of the several classes of beings. These classes of beings, though having mainly in common the faculties of food selection, sexual selection, and self-reproduction, have, nevertheless, been deemed so distinct in character as to give rise to the idea that the typal forms of the several genera and species were the subjects of "special creation," but the endeavor to get rid of the general idea of a personal Creator has "led some naturalists to conceive the notion that they [all living forms] might all have been produced one from the other, and having a common ancestor." Why not at once by an intellectual necessity cross the boundary of evidence and common sense, and discern the origin of that common ancestor in supposititious spontaneous generation? That would for the earth-claiming scientist finally dispose of the very troublesome notion of possible personal moral accountability to the Creator of the heavens and the earth and all that in them is. Yet to imagine an atom of inert matter moving itself into being containing the promise and potency of all terrestrial life, wrenches the mind of man to a degree that is only permissible on the ground of "an intellectual necessity," apart from either morality or righteousness.

The evolutionist under such a necessity knows no law. His lawless intellect transcends the trammels of experimental evidence and endues a motionless mote with inherent power to "transform" itself mto successive forms of being, progressively culminating in an intellectual being capable of conceiving the necessitous idea of a primitive purposeful mote, singular in its inherent potential differentiation from all other particles of non-motile matter.

The normal intellect will experience a sense of refreshment in turning from this last infirmity of noble minds to the old idea of special creations by a competent Creator, the only wise God and Father of our Lord Jesus Christ, "for in Him were all things created, in the heavens and upon the earth, things visible and things invisible."

Recurring to observed facts relative to gradations of being, it is

comparatively easy to understand that what are said to have been progressive stages of development from the simpler to the more complex forms were, in fact, successive special introductions, involving new faculties and limitations, yet including such fundamental features of preceding species as were purposed in the original plan, under Providential superintendence.

The selective faculty of being runs through all grades of created life, the simplest organisms having the narrowest range and the fewest sorts of selectable things; while the genera, the species, their scope, and the selectable objects have been multiplied and varied as the living structures were made more and more complex, until man stood upon the earth as the pre-eminent chooser of all mundane things, and was constituted a new creature by the enduement of moral option. An intelligent man who has had "experimental evidence" that he is a child of his Heavenly Father through simply willing to do His revealed will, cannot be induced to undergo the intellectual retrograde metamorphosis which is of "necessity" the baseless basis of a base transmorphism. Failing in its foundation, the false philosophy must fall, carrying with it all the superimposed structures, even though these were set forth as constructed of verifiable facts collected with painstaking care, arranged in orderly sequences, and ingeniously massed together. But how could the theory be expected to stand a moment when its elaborately wrought design is disclosed as that of an inverted pyramid with its apex resting on a differentiated grain of sand?

Let us indulge the hope that every intelligent and God-trusting dental prosthetist will be found too well versed in the principles and practice of material, mental, and moral mechanics to be deluded by the learned vapidities of the agnostic who will not know or "wilfully forgets that there were heavens from of old, and an earth compacted out of water and amidst water by the Word of God; by which means the world that then was, being overflowed with water, perished, but the heavens that now are, and the earth, by the same Word, have been stored with fire, being reserved against the day of judgment and destruction of ungodly men.

"But forget not this one thing, beloved, that one day is with the Lord as a thousand years, and a thousand years as one day. The Lord is not slack, as some count slackness, but is long-suffering to you-ward; not willing that any should perish, but that all should

come to repentance." Our Lord said: "For this is the will of my Father, that every one that beholdeth the Son, and believeth on Him, should have eternal life; and I will raise him up at the last day."

For our own part, therefore, we may conclude that now, in voluntary mundane mechanics, speech is the power that moves the world, and that dentists are in charge of the mouths which utter the potential words.

SECTION II.

Dental Education, Literature, Nomenclature, Histology, and Microscopy.

Our Dental Educational System.

PAPER BY M. F. AULT, OF THE SECTION.

EXPLANATION.

1. Believing that much of the work of the Association would bear upon practical dentistry, I decided for the sake of variety to not follow my first plan, but not depart particularly from the subject.

2. Our paper will treat the circle of dental schools as a system.

3. We will claim that much of the friction and bad manners in practice is a symptom of weakness in our system.

4. The term moral as it may appear has only to do with the relation of one person toward another.

5. We shall aim to make vivid the meaning of some of our ordinary words and acts by comparison with crime.

6. The paper will try to prophesy and point the way to some needed changes through prevention and suppression.

OUR dental educational system has grown to its present proportion in the midst of a complex civilization. In our development we have increased in sensibility and attained a higher degree of criticism. Our system has been prolific, and, while credited with much good, there is occasion for regret in certain errors, even if it is impossible to secure perfection in a few years. The fifty schools, with their good and indifferent equipments, their sound and erroneous methods, and the various regulating bodies, we style "our dental educational system."

First, Honor to Whom Honor is Due.

The young educators of to-day inherit the fruit of thoughtful and honest men, and are in the presence of others who have given their best strength during thirty or forty years to dental education.

No doubt those who have borne full responsibility look back and feel the reality of a life and death struggle, and their thinking, planning, and working has conferred upon us,—

(a) A comprehensive course covering three years, each year almost complete in itself.

(b) Much time for the accomplishments required.

(c) Heavy expense for both school and pupil.

(d) From twenty to seventy-five teachers required in each school.

(e) Careful instruction provided for each day.

(f) Efficiency the aim, and in large degree the result.

So, as a means of expressing gratitude to our benefactors, we will affirm that to-day we are witnessing the *best day* that dental education has seen. Shall we, in this acknowledgment, conclude that the future is doomed to irreconcilable argument? It does seem that we have almost reached the time when, if we do anything at all, it must be in the application of theories hitherto vague.

There will never be much sympathy with the complaint that there is too rapid an increase in the number of dentists, but there will be a just and growing indignation if vigorous effort is not made to improve professional manhood. The student of affairs detects a mutinous sentiment not based upon jealousy, but founded upon a conviction of injustice. As dental schools possess State charters and are associated, and the good repute of both the college and dentist is determined by dental boards, it is pertinent to consider a responsibility that is seldom emphasized.

The Constitution of Indiana presents in Article VIII the following: "It shall be the duty of the General Assembly to encourage, by all suitable means, moral, intellectual, scientific, and agricultural improvements." In the Constitutions of Arkansas, California, Connecticut, North Dakota, Delaware, Florida, Kansas, Maryland, Massachusetts, Mississippi, Nebraska, New Hampshire, North Carolina, Ohio, and West Virginia I find the word "moral" ranking with intellectual, scientific, and agricultural. In the Constitutions of Rhode Island, Tennessee, Vermont, and Virginia the word

"virtue" seems to stand for moral. In Kentucky and New York we do not find the word "moral" or any term as a substitute, but the Court of Appeals in each State makes the declaration that "sound morality is the corner stone of the social edifice." I did not have time to inquire into the other States, but the opinion is that it is safe to assume that the principle is recognized either in constitution, court decision, or legislative act. In order to reinforce the point we will say that the best scholars in moral law and ethics agree that the terms "moral" and "ethics" mean the same thing. Then if the constitutions named should use the word ethics, the same idea would be conveyed.

I am now aiming to show that the students of the country receive their early training in the presence of a commercial and professional rivalry that will pale under a moral analysis, and from this cultured and half-civilized multitude comes the prospective student with his native and acquired tendencies. We have shown now, as our first step in locating responsibility, that the people in their capacity as a state assume a moral or ethical responsibility.

In view of the principles stated, it seems to me that competent legal opinion would decide that when the colleges received their charters they, in an enlarged sense, became subject to the ethical obligations mentioned in the fundamental law, and when the schools of the various States formed their national confederation that they became as *one person.* If this assumption is sound no school can indulge in the immoralities which we shall present without the whole body suffering, and no disposition of another college to retaliate by a similar offense will remedy the situation. This relation is illustrated in the human organism. Here we have an assemblage of parts, each performing its task to sustain the organism, and if one member suffers the others suffer. Then, in presenting our *second step* in the location of responsibility, I am going to affirm that the *confederation of colleges must face the issue* as an individual.

Suppose the deans of the dental colleges were to appear in body before the chief justice of any State for instruction. Is there a man, even with the most meager insight, who would not believe that he would look upon this body as a court and instruct similar to the definition of a court's duty, "that they are the defenders of public policy; that they are not to be misled by pretenses; that

they must not act under mental reservation; that they are to look at the substance of things, and in their special capacities give effect to their constitutions."

I now wish to ask, *What is dental immorality?*

In the criminal statutes of Indiana there are about four hundred and twenty criminal acts described. Now, while they are called criminal acts, I have it upon good authority that all are immoral acts; so it is doing no violence to the import of either word to say that as moral and ethical mean the same, immoral, unethical, and criminal mean the same. Then whatever we can include under the mild and little-understood term "unethical" must bear the burden of the popular or the more significant word to the people, "immoral," and that the ultimate resting-place of all such acts is in the criminal column. In the catalogue of criminal acts we find assault, libel, trespass, injuring trees, defacing tombstones, aiding a hostile army, challenge to duel, public indecency, aiding a prisoner to escape, creating stagnant water, etc.

We are now prepared to magnify some of the subtle features of dental immorality.

1. What is the difference, so far as culture is interested, between striking a dentist of fine ethical sense and pushing the decorated card of the parlor man under his office door? One assaults the physical, and the other the spiritual.

2. What is the difference between slandering the true and lauding from day to day in the paper statements that sound experience teaches cannot be fulfilled? Both libel true character.

3. What is the difference in overrunning one's land and, without membership, attending a State association from year to year with the apparent motive of avoiding moral obligation, purloining the result of other men's labor, then state in home paper about attending the State association, thus making himself equal to the man who has given many years to associate effort? One trespasses land, the other the moral dominion.

4. What is the distinction between belting an apple tree, destroying the fruit, and locating in a town with all the modern delusions, and thus upsetting the honest education of a faithful practitioner? One destroys the tree, the other the work of a loyal citizen.

5. What is the essential difference in aiding a treasonable raid and encouraging by inaction everything vicious in dental practice?

One attacks the civil government, the other ignores the principles of true life.

6. What is the distinction between challenging to duel and asking one to meet the fifty-cent-up-man? One seeks instant physical destruction, the other a protracted struggle on the field of competitive suicide.

7. What the difference in physical exposure and displaying a boorish nature in a sign forty feet long? One offends public decency, the other professional decency.

8. What the line between aiding a prisoner to escape and aiding a person ignorant in principles and known to be corrupt in escaping from college? One seeks to defeat the civil law, the other the defeat of both moral and civil law.

9. What the ethical difference in blocking a stream, backing stagnant water into the source of pure supply, and appearing before a class without definite preparation and setting afloat the germs of foul anecdote? One accomplishes a few weeks of feverish torture, the other a life of incompetency and vulgarity.

10. What is the issue between defacing the stone which marks the resting-place of Atkinson and refusing to emulate his ideals? One is the act of a common vandal, the other the act of a moral ingrate.

The purpose of this extended series is threefold:

(a) To exalt our conception of the word moral or ethics.

(b) To make an unusual proof of the geometric principle that "things equal to the same thing are equal to each other," and if we are satisfied that both are equal to immorality,—and legislators in the past have seen the one sufficiently to place it on the list of forbidden crimes,—why can we not reasonably expect a proper presentation of the other to favor us with any needed legislation?

(c) To show that the worm which is weakening the vitality of our dental educational system is not necessarily the worm of illiteracy, but that inappreciation of the real side of dentistry, imperfect native talent, the tendency to find easy occupation, to make money rapidly, and all backed by the beguilement of various immorality, is in this age of "paramount issues" the phase of dental training that is most urgent.

What can we expect from graduates when men of long standing in ethical bodies do not comprehend? A student asked a prominent

teacher to examine a card which he had prepared, and the opinion favored everything proposed. He had a prominent official in an ethical society render a decision, and in this we find complete indorsement. The card, to me, presented every evidence of the quack. It mentioned his college, crown- and bridge-work, guaranteed first-class work, and all on very reasonable terms. What is the future of the student when men of position and strong facial expression give such advice? I know of no men who stand higher in honest intention, and yet in our dissection of the case we must place them with the abettors of crime.

A gentleman for whom I feel a genuine affection took a position in an institution, and here is part of what he published, under instruction from his board of directors: "It is the policy of the institution to increase the attendance in all departments, and for this purpose six young men have been commissioned to canvass the State for students; and each old student will be given ten dollars for each new student secured." Is not this an evidence of both financial and moral weakness, and is it not a total abandonment of well-established principles? What six young men will be benefited in ethics who receive their instruction from a board of educators who, when made to submit to the light of true interpretation, must take positions with bribers, rafflers, and pugilists? What six young men, with their inherent depravity stimulated from such a source and under the stress of circumstances, will not scatter misrepresentation, present freakish inducement, and sow a seed far worse than that of the Canada thistle? How does a ten-dollar incentive differ from the bounty offered for pests, and how far removed from the savage's string of scalps? The code which we make the chief test of qualification for admission to a State society states that we must not go from house to house soliciting business. What is the distinction between a hard-pressed young man going from house to house soliciting patients and six young men with money inducement, backed by the authority of a board of directors, going from town to town, indulging in all the low qualities of commercial solicitation? If agents are supplied with catalogues, they bear the germs of immorality. Why should a college, in preparing catalogues, submit to the stump-speech swagger, and have the air of the impostor who brings his auditors under control by description of "huge crags and pinnacles of ice that have stood un-

thawed since the flood"? The code of ethics refers to cuts and special mention. Then what is the difference between a struggling graduate's picture in the daily for the purpose of attracting patients and a professor's picture in a catalogue for the purpose of drawing students? And where is the mark of differentiation between the cut of a set of teeth on a billboard and the cut of a furnace in a catalogue, or any article that belongs to any common laboratory?

Go into State associations where you are supposed to see ethics applied. Are there one thousand dentists in the State and one-tenth on the roll of membership, with an average annual attendance of seventy-five? There are many ways of explaining this ratio. Could it be that a common lawyer, acquainted with moral and civil law, if placed where he could witness the performance would come up at the close of the session with this decision: "Gentlemen, I have been an attentive witness of your proceedings. I detect the faintest glimmer of pure professional spirit. The ninety per cent. of your profession are not interested, because your dental educational system overlooks the basic relation between moral and civil law. Therefore, the moral nature of the student remains in its primitive state, and when in after years he is adrift in a stormy commercial sea, finding himself without anchor, he submits to the belief that self-preservation rests upon a congenital animal instinct. I understand that some parts of your system present a few lectures upon ethics, but this is spasmodic and sentimental, establishes no conviction, and supplants the regular, systematic instruction that should be ably presented throughout the senior year and followed by a rigid examination. And should any student treat this course insincerely and his manuscript not show sound development, he should not be graduated; he will make a demoralizing practitioner, since, after careful training, he fails to reveal the substance of a true citizen and sound professional character. I therefore declare that you have no occasion for surprise, since the fruit of ethics and morality cannot mature in dark places, neither does it grow spontaneously."

From the argument presented we deduce two startling evils in our system, which, if properly adjusted, would have much to do in correcting the numerous minor errors. These evils we will classify as follows:

First. Advertising dentistry.

Second. A defective confidence in the enforcement of existing rules.

In the first we have what may seem a "threadbare" subject; and, while it may be antiquated, its bold and impudent face in every city and town and every daily paper forces us to one desperate conclusion, and that is that it is a *standing daily rebuke to the past and a menace to the future.* My proof that it is a *standing daily rebuke* to the past is found in the preceding pages, and we will fortify the latter opinion from common observation.

It is a menace to the future by *persistently* fixing in the *public mind* the *value* of dental operations, and the daily schedule, *working constantly,* is sure to create a public opinion which will challenge the old and coerce the young practitioners.

The gentleman of fine talent and keen ethical sense is silent, evading the subject in the presence of the patient, and feeling confident that there is a structure building in the mind of the new generation which presents too many precarious elements. And if any member of the new generation needs help in trying to find the forces which are slowly shaping his future, we ask him to see if some schools, in their scramble for students, are not employing means much like the uncouth and beggarly outcry of the ragman. Ask him to analyze the result of this absorption, and see what per cent. can be counted insincere and taking their work as a sort of bluff game. Ask him if the standing daily schedule, with its reflections and assumptions, does not challenge him and pave the way for his future. Yes, while we believe that other callings are crowded more than dentistry, and that it may be some time before we realize the worst, at no remote period the present tendencies will drive the spirit and profit out of practice, and no self-respecting man will assume the risk of the expense of dental education; hence the general tendency is a positive menace to the future.

As to the second evil, *a defective confidence in the sincere enforcement of existing rules,* we need no proof, so give it at once the dignity of an axiom.

Now, it is evident that some "heroic" effort should be made, or we must settle down to the belief that the future presents an unending conflict between colleges for students, and an unending conflict between dentists for business; all effort is to be divested of conscience and characterized by barbarity. The aboriginal would

end the conflict in massacre, but the civilized or commercial savage must protract the conflict from generation to generation; and the true man, in adopting the common commercial tactics, feels his better nature yielding, and, not having the courage to retire to communion with his native hills, nor the disposition to become a martyr, finally submits to the brutal doctrine of the "survival of the fittest." If this means the survival of the best in a moral sense, I agree, but if it implies a struggle between a large and small brute it is a pitiful proposition.

We are well aware that a striking feature of the universe is the power of pushing upward; that a germinating seed must push the soil aside, and before the flower and fruit the plant must encounter gravity and storm; but this belongs to a kingdom without a nervous system. So we seek whether it be possible to relieve unnecessary tension; whether we can restore the lost art of meditation; whether we can live in a more perfect enjoyment, and whether we can change the dictum, "Uneasy rests the head that rules; especially his whose kingdom is a school."

In suggesting a way out we will not attempt an innovation, but depend upon established principles to produce the conviction and hasten the action. It is clear that if the foregoing possesses any potency it is in the antagonism of individual rights. In locating responsibility we have divested the individual dentist, teacher, board, society, or school of the right to be eccentric or for any local interest to obstruct the purpose of a uniform system, and the theory (of all the colleges facing responsibility as an individual) means that principles of education are universal; that the conditions regulating dental operations are the same in St. Paul and New Orleans, and that an immoral act in San Francisco is the same factor in New York. Therefore, a mastery and application of principles will prove the death-knell to a schedule of fees ranging from fifty cents to ten dollars. The foolishness of college yells and class colors will vanish; all insubordination and silly rivalry now elevated to the dignity of college spirit will go down, and there will be ushered in one system possessing similar qualification for teachers, universally approved methods, general rules of order and study, general enforcement of discipline, one unyielding plan of graduation, a universal fraternity, a plan of inspection which does not simply inquire as to the number, size, name, and contents of

rooms, but demands the books (special and uniform), and makes examination with the same relentless authority with which the United States Government inspects a national bank. No effort will command obedience and establish confidence save a distant, austere federal power; and however remote this day may be, of one thing we rest assured, and that is that the real substance of constitutional morality and dental education will not soon be recognized by a capricious individual freedom. (We are aware of constitutional limitation, but the people make constitutions and can amend them.)

I am induced to believe that State boards may continue their present plan of inspection, and the Faculties Association may resolve and re-resolve, but in the inner working where men are left to protect local interests without the support of a positive executive hand in which there is belief in universal justice, rules and regulations become inert, and in *aggregate result* there is little progress, and that which we call our educational system stands as a bird without cerebrum, motionless, wings dragging, opening eyes with a vacant stare, then relapsing into former apathy. As long as there is trace of a belief that a person, irrespective of qualifications, can take one hundred dollars, make the round of schools looking for points of least resistance, and with that money annihilate any rule in existence, deport himself as he pleases, and finally be registered, *that circle which we call a system* will never be stronger or more respectable than the weakest point; and should the conduct of the weakest be tested it would be pronounced illegal, because it is immoral. Judging from decisions bearing upon similar conduct, we have every reason to believe that any supreme tribunal, guided by the general standard of good repute, would not only pronounce the *one* member *arrayed against public policy,* but the *whole system would be condemned.* It is a well-recognized principle that whatever is immoral is against the public policy; that even a contract partially illegal is entirely void. Then why is it not fair reasoning that if an association of colleges establishes rules to determine a contract with a student, and the conduct of one vitiates the contract and the organization fails to assert its jurisdiction in protecting the public policy, the whole system is immoral? It seems to me that, taking what experience has established as a standard for a good contract, an examination of records (if the records reveal actual conditions) would show such a departure from legal

principles and such an utter disregard of public policy that many disreputable dentists could be found with such vitiated contracts as to be stripped of legal support.

In 1895 I read a paper before the Tri-State Association of Ohio, Michigan, and Indiana, in which it was claimed that State boards could not regulate effectively, and after a lapse of five years there is no reason to modify the points claimed. All the men connected with the various endeavors have been earnest, anxious, and aggressive, but in the *aggregate result* we do not see a much improved condition.

How can we explain this seemingly inconsistent position?

First. We can trace it to the temperament produced by a popular government:

The basic principles have been provided, but interpretation is free and easy.

We disregard established forms.

We feel no use for an exclusive tendency.

We are slow to recognize a master.

Our natures are rustic, and the bootblack and outcast interest us more than princes.

We believe in a better future, but the regard for personal freedom checks our zeal in hastening such end.

These and many more similar characteristics stand out in the literature of our people.

Second. As specific, commonplace reasons we believe (1) that it is safe to assume that each board, true to local spirit, will stand by its own colleges and, having a belief in the good intention of the men connected, will refrain from an inspection which seems impertinent, so that which passes as inspection is superficial. I mean that the real intention is toward uniformity, but they do not act powerfully, completely, thoroughly.

(2) In some States members of boards are connected with a college in some capacity, so, having a pecuniary interest, no other college would submit to an inspection, believing that such officer would vitiate the board's decision sufficiently to render it void.

(3) State examiners are often elected by the State association, and college men usually are members of such bodies. Then does not the chance for reciprocal favor paralyze the intention of probing the internal affairs of a school? And can it be shown that I have

a right to help select a person who is able to legislate, judge, and execute the terms of my repute? Also, can it be shown that any State association has a legal right to centralize in a single board the three functions of government, and with this treble power determine the repute of any person or organization?

(4) Dental examiners, according to my understanding, are only proposing a *mental standard* as a solution of a most vexatious problem. It is certainly true that if they had the legal right to annul college charters and crush half the schools, it would operate the same as high license as a means of regulating the traffic in spirits. In the latter we may have fewer saloons, but the *aggregate result* cannot show less drinking.

Is the prognosis favorable?

We think this can be answered encouragingly, provided an invincible energy is applied in two directions: (a) For the purpose of prevention; (b) for the purpose of suppression.

As the points involved must be adjusted according to recognized principles, we will emphasize and try to apply principles rather than show a tabulation of changes. The reasons and comparisons already submitted are intended to enlarge the field of ethical vision, and also suggest preventive measures.

We will need to feel *that an emergency exists,* and it seems to me that it is not extravagant to center our thoughts on the old substantial principle of "public necessity." In the event of riot, contagious disease, and conflagration the principle of public necessity asserts itself, and in less striking illustration the inspection of milk and prevention of gambling are applications of this principle. I am assuming now that we face a crisis, and it is for us to determine whether men who through most of the college life exhibit a faithless nature shall be graduated, and whether the menacing conditions outside can be suppressed. It is for all to determine whether there shall be established a uniform system and a scheme of inspection which will be positive, legal, just, and universal.

If we believe this and feel that our present laws and college rules do not meet the emergency, then we must proceed from what has been done; invoke the same principle, and establish a better condition.

It is claimed by observing legal talent that all civilized nations are enlarging their tables of crime. This to me means one of two things, and may mean both:

First. That which we call civilization is not entitled to the usual credit, believing that the ideal civilization would show a diminishing list.

Second. A lengthening criminal column means an enlarged intelligence or a deeper moral sense, and things which were at one time passed as benign have grown in the public conscience to be malignant.

Upon the second construction we place most reliance. But can we see in this intelligent expansion a hope of placing certain acts with other defined crime?

There is no dispute about "public necessity" saying to me that I *shall not* use milk from a certain dairy as soon as the Board of Health condemns the dairy. Now, while some States instruct dental examiners to revoke a license for "gross immorality," the important question is, Can we secure an act which shall state that placing before uninformed people statements about free and painless extraction is *such encouragement to physical injury* as to be against the public health, and that no such person is a safe guardian of public interest? Habitual drunkenness would probably be called gross, but my belief is that the latter will do less injury than the former. I mean that the most ignorant person has a better chance to take care of himself under that which is called gross than he has under that which passes as an innocent personal right.

Further, it can be shown to any legislator that a drug which produces a painless condition is dangerous, and if it does not produce a painless state it is a fraud. Therefore, in order to secure public health and protect from fraud, any person proposing the use of drugs unknown to recognized classification shall make a full description of the formula and method of use in addition to the usual advertised statement.

If we cannot secure such enactment, it seems that a correct rendering could make the present law sufficient, because all the acts mentioned are evidently gross in themselves and in result far surpass the popular conception of gross.

Public sentiment has settled the question of lottery. It is then well known that one person has no legal right to say to another, "Give me a dollar, and among one hundred chances which I will offer you may become the owner of five dollars."

Does the man who proposes to put in an amalgam filling for fifty cents and a gold filling for one dollar make any better than a lottery offer?

If we should attempt a classification of fillings based upon kind of material, size and location of cavity, and the numerous operative conditions, we can under very simple arrangement account for fifteen distinct amalgam operations and twenty gold fillings of different character. So the offer to put in an alloy filling for fifty cents and up does not mean that there is even one chance in fifteen to get a filling for fifty cents, or one chance in twenty to get a gold filling for one dollar. So it seems to me that all such notices are deceptive and fraudulent, and rank with all lottery schemes; and, if not suppressed, the public should be protected from fraud by having the advertisement state the positive conditions regulating a fifty-cent filling. This would soon become so odious that the uninformed could see things as they are.

I desire to repeat that every proposition herein contained proceeds upon a principle as old as the first civil efforts, *that no individual right can embarrass the claims of public policy.*

Then jars of extracted teeth and forceps displayed on the sidewalk, sensational announcement of new anesthetics (all unknown to recognized classification); all the usual proposals about filling, novel methods, money saved, etc., are symptoms of a grave condition in our educational system. They exist under a confused knowledge of individual right, and they embarrass a true public policy.

It is a settled rule of law that if the general character, tendency, and effect of any business is against the public morals *it cannot have a legal standing.* Then is it necessary to ask the morals of a business which represents the sacrifice of millions of those organs with which nature intended to fortify herself?

An English chancellor a few years ago rendered the following decision: "It is the duty of courts of equity, and the same is true of all institutions, to adapt its practice, as far as possible, to the existing state of society; to the progress daily making in the affairs of men, and not from too strict adherence to forms and rules established under very different circumstances."

So the questions under consideration should be remedied as they are comprehended to-day.

In Wood's "Law of Nuisance" is to be found the following: "The experience of all mankind condemns all occupations that tamper with public morals, tend to idleness, and promotive of evil manners; and anything that produces such results finds no encouragement from the law, but is condemned as a public nuisance." So judgment is already pronounced upon the system, school, society, board, or dentist who tampers with morals, produces idleness, and promotes bad manners.

SECTION II.—Continued.

Dental Education.

PAPER BY L. ASHLEY FAUGHT, OF THE SECTION.

THE subject of dental education to-day presents for consideration three separate and distinct lines of thought. The character of the mental training and educational attainment which should precede the entrance upon dental collegiate study; the curriculum to be presented to the individual student during the period of attendance at dental college; and that effort to be devoted by the profession to lift the general public to an educational plane which shall fit it to comprehend dentistry as a learned profession, and to appreciate the ministrations of a truly educated dentist.

Any one who takes the pains to review carefully all the published literature on dental education, since the first article appeared in print will receive the impression that the profession has at no time been a stranger to the importance of each of these topics; but the reviewer will be convinced that a marked degree of progress has been effected only in relation to the second one,—the nature of the curriculum at a dental college. The advance accomplished in this direction is everything that can be desired. Educational facilities which began years ago in severe simplicity, sufficient for their day, have steadily increased and broadened, by carefully engrafted additions, until we have to-day a system of collegiate dental training which gives to the student an opportunity to acquire a knowledge which is fully commensurate with every possible demand which an exacting public may make upon him in his professional life. This attainment is a thing in which each member of the profession should take an honest pride, for it has not been accomplished easily. The

men who have made such things possible have done it at great personal sacrifice and against untold obstacles, and, thanks to their efforts, we have to-day an educational system in dentistry second to none of the learned professions.

As to the possibilities of further progress in this department, your essayist would direct your thoughts by quoting the words of that earnest teacher, Professor George Barker, which, although written twenty-seven years ago, seem to await to-day as the fitting time for action upon them. He said in 1873, "If I am asked what in my judgment would best advance the interests of dental education, I would answer, reorganize and consolidate the existing dental colleges with faculties selected from the best dental teachers in the land, so situated that they would be convenient to large sections of country and not liable to react upon each other; with uniform fees for attendance and graduation, and such endowment that the greater portion of time of the teachers could be devoted to preparation and delivery of carefully prepared lectures."

This to-day is a consummation devoutly to be wished, but the difficulty of the establishment of the endowment funds stands as the first barrier to be swept away. Every consideration points to the fact that those capable of creating endowment funds for any educational purpose seek the channels of the great universities. They do not give to an individual or to separated institutions, because individuals and such institutions possess no guarantee of permanence or of unselfish interests. These donors seek, above everything, surety of permanence, and full assurance that the trust will be administered for the purpose for which alone it was created. Great universities which have already stood the test of time, enduring above and beyond the lives of any individuals, passing in their ministrations from age to age, around which endowment funds for one purpose and another have and are gathering, alone can promise the field they seek. The indication, therefore, is that those having the best interests of the dental profession at heart should gather their thoughts, their sentiments, and their devotion around the dental departments in these universities, making them stand out pre-eminently as the representatives of the profession. Desire and power to create may thus best meet, and, as to the other institutions, the survival of the fittest would be but a question of time; but these would surely become endowed.

Before passing from the consideration of dental education as administered within college walls, your essayist wishes to express two or three minor points which have obtruded themselves prominently upon his notice. There seems to be a necessity for the development and conservation of the professional idea. If we are to have men in the profession in the future imbued with true professional character and fitted with professional enthusiasm, the seed should be sown during college life. The establishment of chairs to teach dental ethics and dental history is the need of the hour. Careful instruction on these subjects from the lecture stand through the three years of collegiate student life as a course, given the same prominence and made a requirement, as are the other subjects taught, would not fail to develop a better professional grade in the practitioner of the future. Students who have to stand examination on this subject, the markings for which count in their average for advancement or for graduation, will not fail to acquire, and to carry a large part of their acquirement into their future professional life.

The subject of ethics is of vital importance, and needs no argument to convince you that many of the flagrant transgressions apparent in the professional life of to-day are a failure of the head rather than of the heart. They do no better than they know, and many willingly do better when they do know. Why not so teach them as to save them from themselves? The subject is very broad, and when properly considered would point out pitfalls into which the unwary too often come.

As to dental history, inquire of the younger men in the profession and see how meager is the information. Is it natural to have strong ties of family pride and affection when the strings which bind one do not dip deeply into the past? How many of the young practitioners of to-day are familiar with the literature of the profession issued during their term at college? The number is not large, and still less the number of those familiar with it for five years preceding the date of their matriculation; and very few there be who would claim an intimate knowledge dating back to 1840. Let an effort now be made which shall not be dependent upon the personal inclination of the proposed noviate, but which shall by its own requirement compel a knowledge of the past sufficient at least to become a bond with the present of its possessor not easily

broken. Surely from such union must flow to the public a better type of professional spirit.

The weak spot in dental education as administered in dental colleges to-day lies in the department of the demonstrators. What is generally supposed to be a point of strength is, from the standpoint of the student, quite generally claimed not to be effective. Careful inquiry shows that the students would much prefer, and would feel better instructed, if one or two demonstrators in each of the departments of operative and prosthetic dentistry would devote all their time in the institution. The present system so much in vogue, of having a number, each coming to take charge for an hour or so in rotation, is deprecated as exceedingly faulty and unsatisfactory. A change in the manner of examining is also suggested. The average student does not begin to study until the time of the term examinations is at hand. He loafs on his study until this necessity comes as a spur to his lagging. If a system of examination at intervals through the term could be inaugurated the habit of study would be made continuous, and the amount of actual knowledge acquired would be greatly increased. Of course, the markings for these examinations would have to count in making up the term average for advancement or for graduation.

Regarding the dental educational entrance requirement, the profession seems ever to have had it under consideration; that is, to have recognized in a general way that education was a desirable factor. And while the requirement outlined for to-day is not for a moment to be compared with the indefinite ones in the chaotic period reaching from the inception of the profession up to about 1890, still the material obtained through its application is far from satisfactory. Indeed, it is a question whether those entering upon the study of dentistry in 1870 were not better fitted to take up the course of study then given than are the sudents now admitted to take the present course. This perhaps is in part due to the fact that those presenting formerly were usually men of mature years, who had had the time in adding years of life in contact with the world to correct in a measure the deficiencies of early life, whereas the applicants of to-day are for the most part drawn from the youth of the country, filled with an overweening desire to enter a channel of life which they have led themselves to conceive of as leading to riches. It is not to be denied that "haste to be rich" and

the lack of apparent *pay* in scientific education are gross obstacles to the laying of a proper foundation upon which to rear the structure of an educated professional life.

It has not been generally recognized by those who hold back the establishment of an entrance requirement which shall be the equivalent of a diploma of an approved high school having a three years' course that the great increase in the breadth of curriculum presented to-day in dental colleges demands that those entering upon the study should have nothing less than is outlined by this requirement as a preparatory equipment. The steady increase in curriculum demands a high and definite *qualitative* educational entrance requirement. While the dental educators have appreciated the necessity for this increased curriculum, they have not all in the same degree recognized the embargo which they themselves have thus morally laid upon themselves not to admit to it those improperly qualified.

The young student of to-day comes seriously handicapped by the lack of that which springs from the *qualitative* factor,—the ability to acquire knowledge through individual effort. He seems not to know how to study. He sits in front of the professors with the apparent idea that his duty is accomplished in presenting himself, and that their duty is to in some way put a funnel into his brain and pour into it information, as it were, by the bucketful. The ability to apprehend, digest, and assimilate, and the springs of personal action necessary to these ends, seem too often utterly absent. The demand is now more than ever for attention on the part of educators to this *qualitative* factor.

While the idea may savor of the Utopian, and may, like that of Professor Barker's, have to wait some years for its fruition, still your essayist can but believe that in the working out of the strictly *qualitative* factor in the present era improvement in material would result if it were possible to have a school established to give a special preparatory course, the certificate of which school should be an essential to matriculation in *any* dental college.

It now remains but to consider briefly that aspect of dental education which relates to the general public. This your essayist considers is not being rapidly accomplished. What is being done is not by the most desirable agency. It is the non-professional which is creating the public idea of dentistry. When the mass think of

dentistry, is not the exponent of their thought the advertised dental parlor? The synonym surely is not "oral surgery,—medical training with special reference to the oral cavity,"—as it should be.

Is it not true that dentistry stands to-day at the parting of the ways? So rapid has been the progress made by the profession that we are very much inclined to think that it is yet in its infancy, and that much remains for future development; when perhaps the truth is that we have actually passed and realized in the fullest maturity the very fondest expectations and ideals of our forefathers. Indeed, the present status and prestige of scientific dentistry, to say nothing of an ability to render a service fraught with such beautiful results, release from pain, and usefulness, was never even dreamed of in their imaginings.

The impression with the best exponents is growing daily that dentistry in its truly scientific comprehension cannot now continue in further development as from the parent stock, but rather that from now on the parent stock will decline, grow less professional, more commercial, and the services of the future which it renders will have engrafted upon them every stamp of limitation of which it is possible to conceive. In other words, is it not now desirable that from the parent stock should emerge an offshoot which shall be obliged to cut out for itself a position in scientific healing that shall lift those engaged in it, and in turn be lifted by them, to a relationship in the care of that region of anatomy embraced in the oral cavity never contemplated by our forefathers, but the services of which shall be sought, by those requiring them, with the bearing and full appreciation as come the sufferers seeking relief at the hands of other medical specialists? This deviation should from now on be a distinctly marked one, differentiated in every respect from what we have in the past considered to be dentistry. It shall embrace considerable of the mechanical, but very much more of the medical. It shall be followed by those who have the capability to keep away from the rabble and from the uneducated. It shall be very largely, if not absolutely, as free from pain-giving in its ministrations as is surgery conducted under the medical auspices. It shall have nothing to do with the constructing of artificial dentures or other mechanical appliances, but shall dictate when they are needed, direct how they shall be constructed and worn, etc., but delegate the actual construction to a class of artisans who shall do

for the adviser just as the manufacturer of surgical supplies does for the surgeon or the optician for the oculist.

It is not to be understood by this statement that practical knowledge of the mechanical is discouraged or deprecated, for, on the contrary, he who cannot go into the prosthetic laboratory and readily accomplish anything pertaining to this line of service is seriously deficient in the brain development and finger skill necessary to thorough service in any other department of dentistry. He cannot be fitted to direct and dictate.

Rest assured, however, the day is coming, indeed, it is now at hand, when those who practice what is comprehended in the fullest meaning of the definition quoted must be separated from those who practice dentistry in any manner related to the present ideas of the public by every line of demarkation, even greater than that which now separates the oculist and the optician. The men capable of higher things must in the very near future cut loose and go before the public as practitioners of a healing art capable of rendering to suffering humanity services along the lines indicated, in large measure leaving dentistry as understood by our forefathers, as it has from them developed, to the hands of those who are capable of nothing else. Your essayist has always been one of those who felt that these high ideals should be engrafted upon dentistry, and that they must necessarily in time be its expanding and enlargement. But he is now firmly convinced that the time has come when this cannot be, for those who are capable or those who follow this form of practice are, as compared with the hordes who desire and follow the other, commercial dentistry, so in the minority as to call for a stepping aside of the more professional and scientific into a band by themselves; that discrimination shall be forced, and those who want "cheap John" dentistry must go to those who give it, and those who want scientific treatment of their mouths must come with the understanding that they want it and to those who only are capable of giving it. This is along the lines by which a public not appreciating an oculist go direct to the optician, while those who value the eyes seek the oculist.

SECTION II.—Continued.

Popular Dental Education.

PAPER BY J. PERCELL CORLEY, OF THE SECTION.

THE present century has witnessed the evolution of dental art from a trade to a profession; the growth of dental practice from an empiricism to a science. The classical beauty of operative technique, in the present system, touches the ideal. The exquisite fineness of manipulative skill finds, in modern dental surgery, its climax.

The dignity and importance which are accorded to the dental profession attract men of scientific ability, tone, and intellect; while social distinction and lucrative remuneration fills its ranks with commercial charlatans, running the gamut from the street fakir to the polished dental surgeon.

The "blacksmith-barber" dentist served his day and generation, and passed to his reward. Then came the vanguards of the present *régime,* each crystallizing into building stones his own with his ancestors' thoughts, until a colossal structure challenges the admiration of the world. The present status of the profession is a monument to the unselfish labor and untiring zeal of those whom we delight to call the "'fathers of dentistry," some of whom still live and labor among us.

Following the course of nature, increase of importance and power brings additional responsibility. The fundamental source of this evolution has been, of course, individual effort. But the three great factors have been the college, the journal, and the association. All of this education has been exclusively for the dentist. No measure, further than the possible exception of an occa-

sional chapter in a few text-books, has ever been undertaken for the instruction of the public. This, then, we shall assume, is the dentists' burden.

It is a fact, conceded by the profession, that every son of Adam's race is entitled to a perfect denture, and that he should carry the same to his long home. However, we find not one full denture in ten, and not one *perfect* one in one hundred. Is this because our knowledge of prophylaxis is deficient? Not at all. But it *is* due to the ignorance of the laity.

In the best-regulated practice patients often present with abscess from deciduous teeth, first molars with exposed pulps, incisors requiring contour fillings, gums and alveoli ruined by calculus, irregularities which have grown to deformities, and many more irreparable defects. Advice is sought too late. The only remedy now is *patchwork*.

Despite all the education which the public gets at the dental chair, the manufacture of forceps and artificial teeth continues; but the lack of a knowledge of oral hygiene among the people is self-evident. Its need cannot be doubted.

Canada and many of the European countries have laws which prohibit admission to the public schools of children who have decay or disease in their mouths. With our republican form of government, however, we cannot secure such legislation until the public realizes the importance of the measure. And, indeed, were it a statutory requirement, the law could not be enforced without the sympathy and co-operation of the people.

There has been, from time to time, a desultory distribution of tracts, pamphlets, and papers containing information on the care of the teeth, but, having no influential authority to recommend them, they have made little impression on the laity. No organized effort to present the subject of oral hygiene to the people of the United States has ever been made. The difficulty of the undertaking is surpassed only by its possibilities for good.

A plan which seems to be the most practical yet proposed is one which the Alabama Dental Association adopted at its last meeting. The association assumed the responsibility of educating the people of its own State. A "Ways and Means" committee was appointed, with authority to employ and equip a lecturer whose duty shall be to make, under the auspices of the association, a

tour of the state, lecturing to the public in such places as the committee may direct.

This "Ways and Means" committee proposes to make the scheme self-supporting. Every section whose local dentists will contribute to the Finance Committee a sufficient amount to defray its expenses will have a share of the lecturer's time.

If such a work could be organized throughout the United States, the increased demand for dental services would give ample employment to all the operators now in the field. The cry for cheap work would cease. The conditions which make the reign of the charlatan and quack would no longer exist. He would thus be either whipped into line or relegated to the rear. The splendid results would replenish our ranks with the choicest *personnel* from the scientific realm.

The lecturer could be equipped with a stereopticon, drawings, models, etc., and could prepare lectures for mothers, school children, and the general public. Being an employe of the association, he could do evangelistic work among the dentists, thus strengthening the organization.

An intelligent man doing this work could feel the public pulse, and would soon be able to formulate and compile a work that would be a valuable contribution to the family library, as well as to the public and high-school curriculum.

The possibilities of such a scheme are great; the more it is studied the more it grows. May I ask that the National body consider the matter, and if it pronounce the plan a wise and a worthy one let it officially indorse the action of the Alabama Association; and, also, let there be appointed a standing committee to champion the cause of popular dental education.

Organization.

VOLUNTARY PAPER BY SAMUEL J. COCKERILLE.

MR. PRESIDENT: After a night of unusual darkness, the sun broke out with great brightness and permanent luster, and the world realized that dentistry was a profession. For this we are most indebted to Chapin A. Harris. He was generous and high-minded. His aim was always lofty and beneficent.

Since I commenced the study of dentistry I have constantly known some one and usually more men, who were more or less bright and accomplished in certain directions, who felt that dentistry was beneath them, or rather, should I not say, presumed themselves to be above dentistry. The first to fall under my notice was Dr. Gardette, of Philadelphia. He wished our colleges abolished and dentistry taught in medical colleges, and stand as a specialty of physic. This, I think, was in 1852.

The next striking and impressive case was Dr. Robert Arthur. Dr. Arthur spent several days at my house, and impressed me with his earnest manner. Dr. Philip H. Austen in this line made a greater impression upon me than any other man. His was naturally a splendid mind, thoroughly trained and educated. He studied medicine and graduated from one of its schools. Several years subsequently he graduated from the dental college. He produced exactly the opposite impression upon my mind intended by him. He proved conclusively that not merit, but age and the superstition and weakness of the human being gave to the medical profession the standing it has. He convinced me that there are but two professions,—surgery and dentistry.

I have frequently met others who harbored the idea that dentistry is beneath them. They would have us believe that dentistry is a bastard, the child of a professional rape, born in disgrace; should

be butchered and buried, unhonored and unsung. I have uniformly replied to this class of men, "Get out of the profession and unite yourself to one that will make you an honored man."

It is not difficult to say unkind and unfair things of a profession while enjoying a reputation gained entirely from her honorable position. How difficult to see and realize their own daily inconsistencies. It is not difficult to speak contemptuously of a profession when we are conscious that we have no power of commanding its admiration.

To the Virginia Dental Association we said dentistry is the greatest, noblest, grandest, and most glorious profession known to man. Time confirms and fortifies us in this belief. In my best and highest moments I feel this to be true. The more we study dentistry, the more fully appear the benefits and the good it can confer upon the human family.

Spasmodic violence of words is one thing, strength of conviction another. There are two ways of reaching the truth,—by reasoning it out and by feeling it out. All profoundest truths are felt out. Feeling a truth is the only way of fully comprehending it. To speak decidedly is not necessarily to speak presumptuously.

Being the father of the Baltimore College of Dental Surgery was not what made Harris a great man; nor was it the compiling the "Principles and Practice of Dentistry"; nor was it being a useful and honored member of the American Dental Association; nor was it that he edited the *American Journal of Dental Science;* nor was it being a teacher in the Baltimore College of Dental Surgery from its birth to his death. Mr. President, Chapin A. Harris carried into his daily work truth, honesty, and a pure Christian character. Therefore he was thorough in his work. A few days ago I examined teeth that he filled in 1851, about fifty years ago, the fillings as perfect and the teeth as sound as the day they left his hands. The operations are a monument to his real greatness. The man who with taste, judgment, and skill can make the best operations and save the greatest number of teeth is the greatest man in our glorious profession. To enter into a profession and there live firmly and fearlessly according to your own conscience, that is professional greatness.

Dentistry has been and still is being injured and wronged by villainous and contemptible little fees. This has made liars and

thieves of many who would have been good and useful men had their fees justified a proper outlay of intelligence and skill. A want of moral courage has been their curse and ruin. The evil effects have been far-reaching. Mr. President, will you, will your associations and conventions start out this day with a determination to overcome this great mistake and error? If you are not in earnest, difficulties will discourage you, because purpose and will are wanting; you will work, if not in ignorance, in doubt.

"If any man defile the temple of God, him shall God destroy; for the temple of God is holy, which temple ye are." These being inspired words, they are, they must be, true. They say plainly, "Enter not into the door of dentistry, the greatest of all professions, without proper and thorough preparation, and then with full determination to duty. This will enable you to keep the temple of God in normal condition."

The colleges of dentistry are far from having reached a state of perfection in training young men for the great duties of dentistry. The larger number of graduates leave their halls without the foundation upon which they can erect a proper building. Mr. President, it is not only your duty, but that of all older men to aid and help the younger ones. My experience and observation lead me to the belief that this can best be done by judicious and proper organization. Bring the members together, especially the younger ones, and they will reveal the force of character that lies within them. Do not expect or require long essays or speeches, but remember, "A good man seen, though silent, counsel gives." Many are unconscious of their own power; circumstances have not existed to call it forth, but once brought into action their intelligence and energy will surprise those who know them most intimately.

Truth, honesty, skill, and personal character must always have an influence in dentistry and upon her members. Personal character exerts a tremendous influence, conscious or unconscious. Therefore, a profession includes all its members, and does not mean merely the words and deeds of a few of her most gifted sons. The gifted as well as the less fortunate are guilty of misdeeds.

We are agreed that this Association is an indispensable factor of our prosperity and honor. Vigor and acuteness of thought and the intense earnestness of your society, when bent on accomplishing an object, will give to each member all that is good and necessary for

the comfort of mankind. You have the power of contributing to the happiness or misery of your brothers and fellow-creatures. It is your duty to create happiness and abate misery. Selfishness should not stand in your way. The true man delights in nothing else so much as doing good. Rays of a supreme and eternal benevolence give us our happiness. Fertilize their souls by drawing them near to the sympathetic flow of the warm blood of your own hearts.

The valued diamond when first found is rough and unpolished, and needs the hand of the skilled workman to expose its latent beauties which reflect its radiance to the eye. It is often so with the unfortunate. It should be your highest ambition to give a brother opportunity of doing good to himself, honor to this society, and glory to the profession. Let your words shine with candor and openness of heart, and you will exact the highest esteem of all you induce to attend and become members of your society. Let each one see clearly what he can do, then not wait, but act and make himself a conquering power. Work not for personal advancement, but with industry and enterprise for the success of your society. Nothing would more conduce to the dignity and glory of your profession than the entrance into the ranks of all men of thorough proficiency and skill.

Your society must prove that her best energies, industry, and intelligence are devoted to the good and best interests of her individual members, and it will have the gratification of feeling it has won the highest earthly reward in the firm and invincible place it will hold in the respect and affection of its individual members, and it will always rejoice with undiminished zeal and increasing power in doing good. It is your duty to educate the individuals up to their social and professional mission. What is needed for its accomplishment is conviction of its importance on the part of all interested, to be followed by honest, intelligent, and reasonable action. Bring all your brothers together and treat them to a post-graduate course,—a feast of reason and a flow of soul.

Have you been just and liberal to the absent and earned with them a reputation for uprightness, generosity, and unselfishness? Have you shirked the performance of some brotherly duty because it involved the sacrifice of a small amount of your ease, comfort, and money? You should be liberal, generous, noble, with wise

forethought for the good of your brethren, which will increase the prosperity of your society amazingly and contribute to your general advancement. Concentration is the first law of success. Do not scatter your forces, but pour the whole soul of your activity into it, throw the energies of your eyes, your hearts, and your brains into the work. The most regular attendants upon your meetings are those who least need the influence and power of this society, and those who fail to meet with you are they who most need its influence.

"Let us not be weary in well-doing, for in due season we shall reap if we faint not." The absent dentist may possess facts which would benefit you and your society. Ought not you to exert your influence to induce each and every member of the profession within your borders to attend your annual meetings and, using that faculty truly divine, give utterance to their ideas? A truth hidden is unproductive. Let the young brother feel and know that this society has knowledge and something worthy of utterance. That they have only to come into touch with your current of thought to appreciate the fact that you are more than neighbors, you are brothers, and that they will always receive from this society brotherly love. The royal commandment is, you shall love your neighbor as yourself. Let them feel and know that your greatest ambition is to do good to your members and make your society the greatest and finest in the world. Bring every dentist into direct practical relations with your society, and they will soon feel that while working for the society they are benefiting themselves. Your duty must be positive, active, aggressive, outgoing, convincing; that if you are not a brother in kin, nor in the fashion that the world puts on, you are brothers in heart.

Be determined to make a beginning of a higher organization of your society and a higher development of the individual. Look at the immense corporations of the world and take a lesson. Railroads have united and combined their forces, and reaped a corresponding advantage. Capital consolidated, organized, and concentrated abolished chattel slavery, and by controlling wages has enslaved both white and black. This was done by controlling the money. The military maxim, "Divide the enemy and conquer" has in it the wisdom of ages and experience.

Mr. President, when it has been my honor to be present at your

annual meetings the attendance has been slim, distressingly so. This ought not to be the case. Can you not adopt a plan which will bring together at your annual meetings all the dentists of the country?

Unite them into one grand body; move as one man, and strike as a single mind having one purpose. A lack of such concentration and co-operation will produce a waste of power which, in view of the needs of the profession, is scarcely less than wicked. We maintain that no dentist who is entitled to join your ranks has any right to remain outside. In this declaration we believe we have the indorsement of every dentist who has at heart the interests of himself and this society.

Mr. President, have we a sufficient appreciation of the responsibilities that rest upon us with respect to the influences we may exert upon the lives and characters of those about us? We ought to recognize the fact that we are to a certain extent our brother's keeper, and that we should do nothing that will lead him into the wrong and injure him. That our example should, so far as possible, be always good, and never bad, make it your effort and that of your society to elevate every dentist within the borders of our country.

If you were to think deeply and continuously upon this, we have no doubt the oldest and purest would become melancholy and exclaim, "My responsibilities of life have not been fulfilled." Then let your younger members take timely warning. You may each returning year bring together several of your best and wisest members, giants in intellect and acquirements; but if you depend alone upon them to press your society ahead in a career of prosperity and honor, disappointment awaits you. It has been wisely said, not ability, but excellence determines the measure of merit. Bring together the greatest number possible, and each one will soon be striving for greater progress in the march of improvement, and the aggregate of character and prosperity thus attained by the several members will impart to your society the glory and grandeur of its character. Bring all within your jurisdiction into your annual meetings, and let them not only see but feel the advantages they will reap by a regular attendance. Let them join in co-operative work. Draw them into united action, and with shoulder to shoulder they will feel each other's hearts beating in the same devotion to our

glorious profession, and you will all grow in mutual confidence and love. Mr. President, we say to the old members, bring all here and make them realize the possibilities of a new and grander life. Add to their knowledge and you expand their horizon; make them conscious of new wants and they will feel the pulsations of a new life born of increased intelligence. Be true to all you feel to be highest, noblest, most right, and most pure in your minds and souls. Be true to yourselves and our glorious profession.

To our younger brothers we say, Come here, cultivate and enlarge your tastes, and cause the heart to grow. The first and great maxim in religion, art, and science is, Free yourselves from all sectarianism. Pledge yourselves to no man or school; be a slave to no teaching or maxim, but be a slave to truth, honesty, and honor,—a slavery which the world will always hold just and right.

We need the cultivation among ourselves of mutual respect for the opinions and sensibilities of each other. We are brothers of a glorious profession and in a common humanity. Let us have mutual respect for each other's virtues, and mutual forbearance for each other's faults. Let us clasp hands and join arms in the pledge of earnest co-operation, under the dictates of a divine duty, in pressing forward the destiny of our glorious profession in a career of honor and prosperity which will terminate in making dentistry a blessing to our children's children to the remotest generations.

Bring your young brothers here and fill their hearts, souls, and minds with ambition. We do not forget that it is said by ambition angels fell. We do not wish such ambition as filled the heart, soul, and mind of Cæsar and Napoleon. We want the kind that filled the heart, soul, and mind of the leader of the great rebellion, the arch rebel of the world, the immortal Washington, who never had a selfish thought. He labored for the good of his country and the liberty of mankind, and always in the cause of the great Master,—and this is the kind of ambition we wish for the young.

Mr. President, may you, may every man of the profession lead such a life that when the summons comes to join the innumerable caravan that moves to the silent halls of death, you will be able to turn your eyes to heaven and then, looking your fellow-man in the face, say, "I have wronged no man; I have corrupted no man; I have taken advantage of no man."

MINUTES OF THE FOURTH ANNUAL MEETING

OF THE

NATIONAL DENTAL ASSOCIATION.

HELD AT

Old Point Comfort, Va., July, 1900.

FIRST DAY—MORNING SESSION.

FIRST session, Tuesday, July 10, was called to order by the President, Dr. B. Holly Smith, of Baltimore, Md., at 11 o'clock A.M., in the dancing hall of Hotel Chamberlin.

Prayer was offered by Dr. Jonathan Taft, of Cincinnati, Ohio.

Dr. H. J. Burkhart, Batavia, N. Y., presented the following report from the Executive Council:

The Executive Council reports as follows:

Voted—That the change of date of meeting be ratified.

That Dr. A. H. Peck act as Recording Secretary in the place of Dr. Cushing, deceased.

That the next order of business for the morning session be the President's Address.

That a hearing will be given at 4 o'clock on the repeal of that part of the standing resolutions requiring the Executive Committee to obtain from the Chairmen of Sections a list of the essayists and subjects sixty days previous to the time for the annual meeting.

That the evening session shall commence at 8 o'clock, and the first Section to be called is Section III.

All reports of committees and officers are to be presented to the Executive Council, which meets in Room T.

On separate motion, the action of the Chairman of the Executive Committee in connection with changing the date of the meeting was concurred in.

On motion, the balance of the report was concurred in.

Dr. M. F. Finley, Vice-President for the South, was called to the chair, when the President, Dr. B. Holly Smith, read his annual address.

On motion, the address of the President was referred to a committee of three, said committee consisting of Drs. C. N. Johnson, James McManus, and T. T. Moore.

The President resumed the chair.

The time and place for meetings of the several Sections were announced.

Dr. J. D. Patterson made a statement regarding some delegate certificates which were not in regular form. On motion, it was directed that they should be corrected and the names received.

Dr. Richard Grady presented the following resolutions:

Resolved, That a special committee of five (5) be appointed by the President to consider the expediency of inaugurating steps looking to the co-operation of the public schools in teaching "Good Teeth, Good Health."

Resolved, That said committee report the result of its deliberations to this Association at the earliest practicable moment.

Seconded by G. Marshall Smith, D.D.S.

By order of the President, the resolutions were referred to the Executive Council.

The order of business being completed, the Association adjourned to meet at 8 P.M.

FIRST DAY—EVENING SESSION.

Tuesday evening session was called to order by the President at 8 o'clock.

The Secretary read a communication from the American Dental Society of Europe, extending greetings and inviting all accredited

members of the National Dental Association to attend the annual banquet of the European Society to be held in August.

On motion, the Secretary was instructed to send a suitable message to the above society.

Dr. H. J. Burkhart read the report of the afternoon session of the Executive Council.

The Executive Council reports as follows:

Recommends—That the Association appoint a committee of five to act in accord with the resolutions presented by Dr. Grady, regarding the co-operation of public schools in matters of dental education.

That the communication presented by the Committee on Army and Navy Legislation be read to the Association by the Secretary.

That an order be drawn on the Treasurer for $345.30, as per expense bill presented by the committee.

That the communication presented by Dr. R. Ottolengui be read by him to the Association.

That the Council shall meet at 8.30 o'clock Wednesday morning, and that the Association begin at 9 o'clock.

On motion, the report was concurred in.

On motion, the credentials of Dr. Allen, of Pennsylvania, were accepted.

The annual report of Section III was read by the Chairman, Dr. T. E. Weeks.

Report of Chairman of Section III.

WHILE this, the representative body of dentists, has for many years been divided into Sections, we never have secured the definite sectional division and success attained by the American Medical Association. The chief reason for this is that dentistry is not so definitely specialized as medicine. It has been the rule that the rank and file of our profession have desired to hear and see *all* that was offered at a meeting, consequently all was presented in one common meeting; but, as we specialize, the specialists demand a more careful handling of their chosen subjects than can be had in a general meeting. Last year

it was decided to try the experiment of definite and independent sectional work with Section III. We have endeavored to present a program consisting of a few subjects which are more or less closely allied. These subjects will be presented through the medium of papers, clinics, and exhibits, and will be discussed at the sessions of the Section, which will be held at such times as will not interfere with the general sessions, thus enabling all who are interested to participate.

We feel that Section meetings of this kind will offer a better opportunity for full discussion than can be had in a general session, where more or less business and matters foreign to the subjects serve to distract the attention of the members. The leading topics for this year are cavity preparation, including the establishment and maintenance of a correct interproximal space, and inlays, both porcelain and gold. The success of the plan does not depend upon the officers of the Section, the essayists, and clinicians alone, but upon all the members of the Association, especially those who are interested in operative dentistry, materia medica, and therapeutics. Your attendance upon the sessions and participation in the discussions will assure the success and perpetuation of the Section as a distinct entity. As chairman of the Section, voicing the sentiments of my colleagues, I venture a plea for its continuance and establishment upon a permanent basis.

First we have to consider our aims,—the conservation of human teeth and the improvement of the ability of practicing dentists to conserve teeth; next, how to accomplish most in this direction. The old axiom, "In union there is strength," applies with full force to us. We can never *arrive* if we continue to cavil over *methods* and ignore the *principles* which govern, for there is in everything a governing principle. When principles are recognized by all, and followed so far as circumstances in each case will permit, then will we accomplish most. If we of Section III will make the discovery and establishment of principles our aim, we have a life-work. In almost any division of the work of this Section we find divergence of opinion. A glance over the field of operative dentistry will convince every one of the need of more unanimity. This must come from a more general recognition of basal principles. We of this Section can surely accomplish much in this direction if we work together. Much has been done in the way of investigation, but

there is still a great unexplored country. I hesitate to mention any names because of my inability to include all who are deserving, but when it is understood that the names mentioned are introduced solely for the purpose of illustration, I trust no offense will be given.

In the field of materia medica and therapeutics we have all profited by the careful experiments of Dr. A. H. Peck with cocain and eucain, also with the essential oils. This suggests a pertinent question—why can we not have the results of these and similar experiments reported to the National Dental Association? By our by-laws we cannot receive anything which has been presented elsewhere. Can this not be overcome by having one or more men appointed in each State whose duty it shall be to either secure such reports direct or to see that the society before which they are presented presents them to this body?

In operative dentistry we are indebted to Dr. G. V. Black for many things. This body would do well to take such measures as would secure the collection and systematic presentation of the results of his researches. This body should be the forum where such matters are discussed and verified. Investigators along all lines ought to be made to feel that here is the proper outlet for the results of their labors; be made to feel that the stamp of approval of this body is worth securing. This can be accomplished only by getting in closer touch with the men who work and think, through representatives duly appointed with sufficient authority and interest to induce them to look up the men in their respective territories who can and will contribute to the progress of our profession.

I have departed somewhat from precedent in this report, and shall refrain from mention of books and articles upon the subjects of this Section. Furthermore, a passing notice is entirely inadequate to our needs. What we require is to have these matters presented here in such a way that they may be thoroughly digested and assimilated. We trust that the matter which our Section contributes to the program will be acceptable, and that the suggestions we offer will provoke a discussion which will result in the adoption of such measures as will enhance the power for good of this body.

Dr. C. N. Johnson then read his paper, entitled "Inlays, their Advantages and Limitations."

The discussion was opened by Dr. W. V-B. Ames, and was continued by Drs. E. T. Darby, Geo. V. I. Brown, R. Ottolengui, C. S. Butler, J. Y. Crawford, J. N. Crouse, and M. L. Rhein. The essayist closed the discussion.

On motion, the Association adjourned to meet at 9 o'clock Wednesday morning.

SECOND DAY—MORNING SESSION.

Wednesday morning session was called to order by the President at 10 o'clock.

The chair announced the appointment of Drs. Richard Grady, H. H. Johnson, W. E. Walker, I. P. Wilson, and C. N. Johnson to act in accord with the resolutions presented by Dr. Grady.

Dr. Burkhart read the report of the morning session of the Executive Council.

The Executive Council reports as follows:
Recommends—That two additional members be appointed on the Committee on History.
That Dr. Patterson present the matter pertaining to the newspaper article and Dr. Ottolengui.
That Dr. Johnson read report of Committee on President's Address.
That the Council shall meet at 3 P.M., and the Association at 7.30 P.M.

On motion, the report was concurred in.

The Committee on Credentials read the name of Henry W. Morgan as delegate representing the Tennessee State Dental Association; also J. N. Crouse as representing the Illinois State Dental Society.

Dr. J. D. Patterson, on behalf of the Committee on Ethics, reported the matter of Dr. R. Ottolengui and an article which appeared in a Sunday issue of a New York and Chicago newspaper.

On motion, Dr. Ottolengui was granted the privilege of making an explanation, which he did.

On motion, the doctor was exonerated from all blame in the matter.

Dr. John I. Hart, Vice-President for the East, was called to the chair, and Dr. C. N. Johnson, Chairman of the Committee on the President's Address, read their report, which follows.

Report of Committee on President's Address.

TO THE MEMBERS OF THE NATIONAL DENTAL ASSOCIATION: Your committee have the honor to report that we fully concur with the President's suggestion regarding the support which should be given the National Association by the Faculties and Examiners Associations, and particularly the State organizations. These in the past have not taken the earnest interest which they might and should have taken toward increasing the membership. This is especially true of delegate membership.

We most heartily and emphatically indorse the President's suggestions in regard to the acceptance of associate memberships delegated from foreign societies.

We concur with the suggestion to the Paris Congress Committee in regard to a conference at the International Dental Congress at Paris next August leading to closer affiliation among the various dental organizations of the world. We would also venture to urge upon this committee the necessity of earnest work in this direction on this most opportune occasion.

We believe that the President's recommendation regarding the appointment of commissions by the various Sections for the purpose of systematizing and crystallizing the thoughts and methods of the profession up to date is most practical and feasible, and we thoroughly indorse his suggestion and ask that a committee be appointed to carry out this idea.

We respectfully ask the Association to carefully consider the question of the Surgeon-General's intimation that this Association suggest candidates for appointment as examining dental surgeons

under the proposed law, and the committee feels that the power to recommend resides with the Executive Council.

We indorse all the President has said on the subject of a proposed history of dentistry, and concur in his recommendation as to the continuance of the present committee and its enlargement. The suggested vote of thanks will be more effective and appreciated if the members of the Association and profession will awaken to the necessity of active and earnest effort in assisting the committee in collecting the necessary data to make a history what it should be, —one of facts. The co-operation of the dental magazines in publishing the preliminary reports will aid most effectually the work of the committee, and it would seem to be the duty of the editors and publishers of these journals to further this work in every manner possible. This preliminary work should be advanced rapidly before the final passing away of all the pioneers.

With regard to the establishment of a scientific bureau, it is the sentiment of the committee that if the idea of the sectional commissions be fully carried out it will adequately cover the ground.

Respectfully submitted,

C. N. JOHNSON,
JAS. MCMANUS,
THOMAS T. MOORE,
Committee.

On motion, the action of the Executive Council in adopting the report was concurred in.

Dr. E. K. Wedelstaedt read his paper. Subject, "A New Cavity Preparation for Distal Cavities in Cuspids."

The discussion was opened by Dr. C. N. Johnson, and was continued by Drs. Thos. Fillebrown, T. E. Weeks, and J. D. Patterson. The essayist closed the discussion.

Section IV was called. Dr. J. D. Patterson, Chairman, reported no papers.

Section V was then called. Dr. W. C. Barrett, Chairman, read his report.

Report of Chairman of Section V.

SECTION V embraces so many fields of interest that it is somewhat difficult to select single points for presentation in its annual report. And yet to throw the whole broad domain of normal and morbid anatomy open for consideration, when the time is limited at the most to a very few hours, is but to invite a desultory, superficial, profitless discussion. The Chairman of the Section has, therefore, in the interests of the Association, assumed an authority which might perhaps be successfully questioned, and has selected certain definite points for elaboration; and that there may be some certainty of a proper presentation, he has named the essayists who are charged with the duty, and not left the matter dependent upon chance. The Section is, therefore, reasonably certain to advance something of permanent interest.

It desires to offer the following as the regular program, volunteer papers to be presented only after these shall have been considered, unless the Association, by vote, shall order otherwise:

Anatomy.—"The Evolution of the Complex Molar from the Simple Cone," paper by A. H. Thompson.

Surgery.—"Antiseptic Surgery of the Face and Mouth," paper by W. H. G. Logan.

The chairman desires to present one single point in addition. The subject of inflammation lies at the bottom of all pathologic action, for it is to the nutritional changes involved in that comprehensive process that tissue and functional modifications are chiefly due. Under the old method of study of that which has been denominated "inflammation" there was much of complication and little of true comprehension. According to the nomenclature of the early pathologists, there were as many different kinds of inflammation as there were functional modifications produced by it. Each degenerative change was considered as a distinctive disease, with its own special nomenclature and method of treatment.

Accordingly, we find laid down in the older text-books acute, chronic, catarrhal, interstitial, parenchymatous, specific, and plastic inflammation, with all those terminating in "itis," as osteitis, myelitis, gastritis, pharyngitis, pneumonitis, carditis, pulpitis, periostitis, and many more, each to be studied as a separate affection from an

individual standpoint. That product of certain degenerative changes which is called "pus" also had its separate pathology, and accordingly there was laudable, ichorous, sanious, serous, catarrhal, mucoid, and other kinds. A more modern conception of the changes which result in suppuration now considers these definitions as descriptive only of accidental or secondarily degenerative forms in suppuration. It is not intended to assert that these terms have become entirely obsolete, but they no longer convey the same meaning that was formerly attached to them. Instead of being descriptive of definite changes, they simply designate certain phases assumed during the same process, or they may particularize the same general modifications in specific tissues or organs.

Formerly that which is now included in the term "hyperemia" was considered a part of the inflammatory change. The modifications in vaso-motor function, which are the consequence of irritation, were classified as the initial steps in the inflammatory process, and hence the latter might be viewed as either progressive or retrogressive, according to its termination. Indeed, some modern pathologists, while recognizing and accepting the later conclusions, yet for convenience' sake speak of hyperemia as, at the very least, leading up to that which is more properly distinguished as inflammation.

The better comprehension of the influence of the fungi which has been brought about by the investigations of modern bacteriologists has completely modified many of our ideas of the morbid processes. Many changes, once supposed to be idiopathic, are now known to be deuteropathic. The list of diseases now known to be zymotic in their origin includes the majority of those most fatal to mankind. The deadliest degenerations are those due to the presence of specific organisms. The intensity of the vegetable and mineral poisons produced in the due processes of nature bears no comparison to the virulence of the toxins that are the result of infection. The lethal dose to some of the smaller animals of the alkaloid strychnia is about one-tenth of a grain, while the septic product of the bacillus of tetanus produces as deadly effects when one-ten-millionth of a grain is used.

The researches of the past few years have modified the views of pathologists concerning that process called inflammation. It now belongs in the domain of bacteriological pathology. There is but

one general form of inflammation, and it is the result of septic infection. It is necessarily degenerative in its nature, and begins with the destructive process. All of that which comprises the early nutritive changes, which has to do with the modifications in the blood-supply and is dependent upon vaso-motor influence, now is classed as hyperemia, inflammation having its inception in septic inoculation. There is no inflammation until infection, and with an aseptic condition inflammation as a degenerative process ceases.

This materially simplifies our ideas of pathology, and ascribes to zymogenic influence that which was formerly supposed in many cases to be strictly idiopathic. But it gives to hyperemia an added significance and opens another rich field to research. For dentists it puts that which has been, and still is, denominated "pulpitis" and "pericementitis" in another light, and enables us to comprehend certain changes which to the dental pathologist of a few decades ago were a sealed book.

Dr. A. H. Thompson not being present, his paper, "The Evolution of the Complex Molar from the Simple Cone," was read by Dr. W. C. Barrett.

The discussion was opened by Dr. Barrett, and continued by Drs. J. D. Patterson and Gordon H. Claude, and was closed by Dr. Barrett.

Dr. W. H. G. Logan read his paper, entitled "Antiseptic Surgery of the Face and Mouth."

The discussion was opened by Dr. M. L. Rhein, and was continued by Drs. Gordon H. Claude, James Truman, T. W. Brophy, Geo. V. I. Brown, J. Y. Crawford, Geo. W. Cook, T. B. Hartsell, and V. H. Jackson. The essayist closed the discussion.

The chair announced the appointment of Drs. Jonathan Taft and H. B. Noble as additional members to the Committee on History.

On motion, the Association adjourned to meet at 8 P.M.

SECOND DAY—EVENING SESSION.

Wednesday evening session was called to order by the President at 8 o'clock.

Dr. H. J. Burkhart read the report of the afternoon session of the Executive Council.

The Executive Council reports as follows:

Recommends—That the Committee on Army and Navy Legislation be empowered to draw on the treasury not to exceed $250 during the ensuing year.

That the above committee be increased to five members.

That a committee of five members of the Association be appointed on ways and means, for the furtherance of this work.

That Dr. W. F. Sharp, of San Francisco, be admitted to membership in the Association and sign the constitution and by-laws.

That the proposed amendment to Article XIII be adopted.

That the proposed amendments to Articles III and IV be adopted.

That the proposed amendment to Article VI be rejected.

That the proposed amendments to Article VIII of the constitution be acted upon by the Association, and that it be made the first order of business on Thursday morning.

That the report of the Auditing Committee on the Treasurer's books, which were examined and found to be correct, be adopted.

On motion, the report was concurred in by the Association.

The chair announced the appointment of Drs. Jonathan Taft, W. E. Boardman, and E. S. Gaylord as Committee on Necrology.

Dr. T. P. Hinman, Chairman of Committee on Clinics, read the announcement of clinics.

Dr. Wm. Ernest Walker, Secretary of Section I, read his report.

Report of Secretary of Section I.

SECTION I would report that five papers were received, as follows: "Art in Prosthetic Dentistry," Dr. Mary E. Gallup, Boston; "The Mechanical Fixation of Teeth Impaired by Disease," Dr. F. G. Gregory, Newark, N. J.; "A System of Removable Bridge-Work," Dr. W. E. Griswold, Denver, accompanied by diagrams; "Mechanics as Related to Dentistry," Dr. W. Storer How, Philadelphia; "Ideal Crown- and Bridge-Work," Dr. Nelson T. Shields.

As per Constitution, these were referred to the joint committee, which referred them back to the Section, recommending that the paper by Dr. Mary E. Gallup be read before the general meeting.

The rest of the papers as mentioned were read before the Section, and it was recommended that they be read before the general meeting if there is time, and if not, that they be referred to the Publication Committee.

The paper of Dr. Griswold, as well as that of Dr. Shields, is accompanied by models and apparatus, which were recommended and referred to Section VI to be used as demonstrative clinics.

On motion of Dr. Ottolengui, it was resolved that all operations including the use of porcelain art belonging to Section I.

It was resolved that it was the sense of Section I that the word "prosthodontia" be adopted to indicate all operations included under the present terms "mechanical" or "prosthetic" dentistry, and that the adoption of this word formally by the National Association be recommended.

WM. ERNEST WALKER, *Secretary.*

Dr. Mary E. Gallup read her paper, entitled "Art in Prosthetic Dentistry."

The discussion was opened by Dr. C. S. Butler, and was continued by Drs. J. Taft, Junius E. Cravens, Geo. H. Wilson, Wm. Ernest Walker, Robt. H. Nones, and J. Y. Crawford. The essayist closed the discussion.

The chair announced the appointment of Drs. James Truman, C. S. Butler, and C. N. Johnson committee to see that the suggestions in the President's address were carried out.

Dr. H. J. Burkhart read the following report from the Executive Council:

The Executive Council reports as follows:

Recommends—That the Council shall meet at 9 o'clock Thursday morning and the Association at 9:30.

That the discussion of the President's address be made a special order for 10 o'clock.

Dr. E. T. Darby was granted a few minutes in which to speak of a method of devitalizing pulps with equal parts of carbolic acid and chloroform by injection.

Dr. W. E. Griswold read his paper, entitled "A System of Removable Bridge-Work."

On motion, Dr. Nelson T. Shields read his paper, entitled "Ideal Crown-Work."

On motion, discussion of these papers was postponed till Thursday morning session.

On motion, Association adjourned to meet Thursday morning at 9.30 o'clock.

THIRD DAY—MORNING SESSION.

Thursday morning session was called to order by the President at 10 o'clock.

The special order, the amendments to the Constitution, was taken up, and the amendments were adopted.

Dr. H. J. Burkhart read report of morning session of Executive Council.

The Executive Council reports as follows:

Recommends—That the report of the chairman of Section I be adopted, except as to the substitution of the term "prosthetic dentistry" by "prosthodontia," and as to the transfer of porcelain art, which it was voted should remain with Section III.

That Dr. Black be allowed ten minutes to explain the manu-dynamometer.

On motion, the report was concurred in.

Dr. Shields's paper was discussed by Dr. J. Y. Crawford. The discussion was closed by the essayist.

Dr. Thos. P. Hinman, President of the Southern Branch of the National Dental Association, was called to the chair.

Dr. Griswold's paper was discussed by Drs. Nelson T. Shields, H. J. Goslee, F. N. Brown, W. V-B. Ames, and J. N. Crouse. The essayist closed the discussion.

President Smith resumed the chair.

Dr. W. C. Barrett rose to a question of personal privilege; which being granted, he introduced Dr. E. L. Oldfield, of Melbourne, Australia. On motion, the courtesies of the floor were accorded the doctor.

DR. BARRETT: Mr. President, I rise to a question of personal privilege. We are always glad to welcome our fraternal brethren from whatever portion of the world they may come, provided they are properly indorsed and we know who they are. We have with us at present a representative from the antipodes, where they are having their midwinter just when we are in the throes of this boiling heat; a country directly opposite us on the map of the world, but, I am happy to say, a new country like our own, inhabited by a like people of the same good old English origin, who are striving to stand side by side with us in all good words and works. They are at the very least our cousins, once or twice removed perhaps, but still of the same blood and tongue, with whom we hope for a better acquaintance. I desire to present Mr. Oldfield, of Melbourne, Australia, and move that the courtesies of the floor be extended to him.

THE PRESIDENT: Mr. Oldfield, it gives me very great pleasure, as the presiding officer of this body, to express to you our welcome, and to say to you that the courtesies of the floor are extended to you. We are glad to have you with us. (Applause.)

DR. OLDFIELD: I can assure you that at this great distance from my home I can well appreciate the warm reception you have given me. I have been away from home now since November. Unfortunately, I was sent away for the purpose of giving my eyes a rest. I am endeavoring in my travels to gather all I can that may assist us in the further and better development of dental education in my colony. We are just emerging from the dark ages there. Five years ago there was not such a thing as a dental college. Now we have two. There is great promise for the future of dentistry there, and we hope, with the political changes that are taking place there and the probable federation of the colonies, we may have a system of dental education throughout the whole of those six colonies. I need not say that we look to America as the pattern. I thank you sincerely for the kind reception you have given me.

Dr. G. V. Black then explained the workings of his instrument, —the manu-dynamometer.

Dr. T. W. Brophy, Vice-President for the West, was called to the chair.

The special order, discussion of the President's address, was taken up.

On motion, it was directed that the recommendations of the Committee on the President's Address be taken up serially for discussion.

By request of Dr. C. N. Johnson, the President explained the recommendations contained in his address.

The subject was then discussed by Drs. J. N. Crouse, J. Y. Crawford, James McManus, M. F. Finley, E. A. Bogue, Thos. P. Hinman, and E. T. Darby.

On motion, the subject was passed.

On motion, the Association adjourned to meet at 8 o'clock.

THIRD DAY—EVENING SESSION.

Thursday evening session was called to order by the President at 8.45.

Dr. H. J. Burkhart read the report of the afternoon session of the Executive Council.

The Executive Council reports as follows:

Recommends—Adoption of Secretary's report; also report of Corresponding Secretary.

That The S. S. White Dental Mfg. Co. be permitted to publish the Transactions on same terms as they have previously done.

The adoption of resolutions regarding Dr. Crouse and the Protective Association.

Adoption of report of Dr. Crouse on Protective Association, whose books and vouchers were examined and found correct.

Adoption of resolution from Section III.

That the election of officers be made a special order for 10 o'clock.

Adoption of report of committee to devise a scheme to form a commission to carry out the suggestions in the President's address.

That an order be drawn on the Treasurer for $400 in favor of Dr. Wms. Donnally, to reimburse him for expenses incurred in connection with committee work.

That the charges of unprofessional conduct against Dr. J. N. Crouse be dismissed, as no proof was presented to substantiate them.

On motion, the report was concurred in.

Dr. F. J. Maynard spoke on the amendments to the Constitution and By-laws which were proposed one year ago, and which were to be acted upon at this meeting.

It was moved to adopt the proposed amendment to Article III, Section 3. Discussed by Drs. J. N. Crouse, J. D. Patterson, and Thos. Fillebrown. The motion was carried, and the proposed amendment was declared adopted.

On motion, the proposed amendment to Article IV, Section 1, was declared adopted.

On motion, the proposed amendment to Article VI, Section 2, having for its object the abolishment of the Executive Council, was declared rejected.

A division of the house was called for. Discussed by Dr. J. N. Crouse. The vote by division stood unanimously in favor of rejection of the proposed amendment, and it was so declared.

Dr. Thos. P. Hinman, Chairman of the Committee on Clinics, read his report.

OLD POINT COMFORT, VA., July 11, 1900.

The Chairman of the Clinic Committee begs leave to make the following report:

It has been decided that the clinics should be made on models as far as possible, for the reason that the method could be more readily explained, and clinics are given for the purpose of showing method and not the individual skill of the operator. Therefore the system known as Table Clinics was adopted.

Section III offered the following clinics:

"The Use of the Manu-Dynamometer and the Gnatho-Dynamometer," G. V. Black, Chicago.

"Porcelain, Crown- and Bridge-Work," illustrated construction by models, H. J. Goslee, Chicago.

"Gold Inlays," Dr. W. V-B. Ames, Chicago.

"Application of the New Cervical Clamp with Pad," Dr. J. Austin Dunn, Chicago.

"New Amalgam Crowns; Use of New Instrument for Filling Over Screws," Dr. Henry Barnes, Cleveland.

"Use of Jenkins Enamel for Producing Buccal Surfaces for All-Gold Crowns," Dr. George Evans, New York.

"Setting Post Crowns, with New Cement Syringe," Dr. C. H. Robinson, Northfield, Minn.

"Method of Combining Cement and Amalgam for Filling Teeth," Dr. L. C. Taylor, Hartford, Conn.

"Use of Porcelain in Crown- and Bridge-Work," Dr. James O. Wells, Minneapolis, Minn.

"Clamp for Holding Artificial Tooth While Grinding," Dr. A. B. Allen, Chicago.

"Aseptic Mouth Lamp, New Cautery, and Root-Dryer," Dr. Sol. Freeman, New York.

"The Use of a New Rotating Corkscrew Plugger," Dr. C. W. Jones, St. Paul.

The following prepared and exhibited cavities, showing their method of preparation of same:

Dr. L. G. Noel, Nashville, Tenn.
Dr. C. N. Johnson, Chicago.
Dr. Lawrence P. Leonard, Waseca, Minn.
Dr. L. L. Barber, Toledo, Ohio.
Dr. L. C. LeRoy, New York.
Dr. W. C. Deane, New York.
Dr. S. Goldsmith, New York.
Dr. Thomas E. Weeks, Minneapolis.
Dr. G. V. I. Brown, Milwaukee.

Section I offered the following clinics:

Dr. W. E. Griswold, Denver, Col., a system of removable bridge-work.
Dr. Nelson T. Shields, New York, ideal crown- and bridge-work.
Dr. Charles L. Alexander, Charlotte, N. C., hood abutments and cast fillings.

The clinics were held in the hall, beginning at 2.30 P.M., Thursday, July 12.

Respectfully submitted,

THOS. P. HINMAN,
Chairman Clinic Committee.

On motion, the report was accepted.

Dr. M. F. Finley, Secretary of Section II, made a brief verbal report in the absence of Dr. S. H. Guilford, Chairman.

Dr. M. F. Ault read his paper, entitled "Our Dental Educational System."

The President announced the appointment of Drs. T. T. Moore, J. A. Libbey, and Gordon White as additional members of the Committee on Army and Navy Legislation.

The special order of business, selection of place for next meeting and election of officers, was taken up.

Dr. J. N. Crouse moved to make the time of the next meeting the first Tuesday in August, 1901.

Dr. Jas. Truman proposed an amendment to the Constitution to the effect that the next annual meeting of the Association convene on the first Tuesday of July, 1901, and asked immediate vote. There being objection, the amendment was declared rejected.

Dr. J. N. Crouse then offered an amendment to the effect that the next annual meeting convene on the first Tuesday of August, and asked that immediate vote be taken. The amendment was unanimously adopted.

By ballot, it was decided that the next annual meeting should be held in Milwaukee, Wis.

The election of officers for the ensuing year resulted in the selection of

President—G. V. Black, Chicago.
Vice-President for the West—Truman W. Brophy, Chicago.
Vice-President for the South—M. F. Finley, Washington, D. C.
Vice-President for the East—E. S. Gaylord, New Haven, Conn.
Recording Secretary—A. H. Peck, Chicago.
Corresponding Secretary—Mary E. Gallup, Boston.
Treasurer—Henry W. Morgan, Nashville.
Executive Committee—C. N. Johnson, Chicago; V. H. Jackson, New York; Thos. P. Hinman, Atlanta.
Executive Council—H. J. Burkhart, Batavia, N. Y.; J. Y. Crawford, Nashville; B. Holly Smith, Baltimore; W. E. Griswold, Denver, and Thos. Fillebrown, Boston.

On motion, the Association adjourned to meet at 9 o'clock Friday morning.

FOURTH DAY—MORNING SESSION.

Friday morning session was called to order by Vice-President J. I. Hart at 9.45 o'clock.

By a rising vote the Association extended its thanks to Dr. J. N. Crouse for his many years of excellent service as Chairman of the Executive Committee.

As reported by the Chairman, Dr. Patterson, the Executive Committee was organized as follows: J. D. Patterson, Chairman. First division, Committee of Arrangements—J. D. Patterson, C. N. Johnson, H. A. Smith. Second division, Committee on Credentials and Auditing—V. H. Jackson, T. P. Hinman, T. S. Waters. Third division, Committee on Voluntary Essays—C. S. Butler, G. V. I. Brown, J. Y. Crawford.

Paper by Dr. L. G. Noel was read by title and ordered printed in the Transactions.

Dr. M. F. Finley, Secretary of Section II, read the following papers by title, and, by vote, they were ordered printed in the Transactions: "Organization," by Dr. S. J. Cockerille; "Dental Education," by Dr. L. Ashley Faught; "Popular Dental Education," by Dr. J. Percell Corley.

Dr. T. E. Weeks, Chairman of Section III, reported the selection of Drs. H. H. Johnson, E. S. Gaylord, and W. E. Griswold as commission to assist the officers of said Section in the Association work.

Dr. J. D. Patterson read names of delegate members.

The President-elect, Dr. G. V. Black, was conducted to the chair by Drs. J. N. Crouse, J. Y. Crawford, and James Truman.

The President announced the appointment of Drs. J. N. Crouse and W. E. Grant as members of the Publication Committee.

Dr. J. Taft, Chairman of Committee on Necrology, made the following report:

Report of Committee on Necrology.

DR. GEORGE H. CUSHING.

IT is with sadness that we announce the death, after an illness of only three or four days, of Dr. George H. Cushing.

He was born May 11, 1829, and died at his home, near Los Angeles, Cal., May 25, 1900.

He became a member of the American Dental Association in 1865; its President in 1872 and Secretary in 1878, and annually thereafter until the merging of the association into the National Dental Association in 1897. He was elected Secretary of this Association on re-organization, and continued in that office till the time of his death.

Dr. Cushing was a teacher of more than ordinary ability. He was four times called to the professorial chair; first as professor of operative dentistry in the Chicago College of Dental Surgery in its formative days. After this he occupied the same chair in the Northwestern Dental College, and subsequently the same position in the Dental Department of the Northwestern University, and lastly in the Dental College of the Southern University of California, which position he occupied at the time of his death.

He possessed great natural ability as an instructor, and those he aided in this way are numbered by the hundreds, and are distributed throughout the profession.

Resolved, That we mourn his loss as personal, because every member of this Association knew and loved him as a friend, valued member, and faithful officer; be it further

Resolved, That in Dr. Cushing we mourn the loss of one who was in every sense an inspiration. His life was devoted to his profession in a manner little understood by its members, and his influence for good was invaluable, and always to be relied upon. And we express our high appreciation of his untiring efforts and devotion to the upbuilding of the dental profession.

Resolved, That these resolutions be spread upon the records of this Association, and that a page be devoted to the same in our Transactions; also that a copy of this statement, properly prepared, be sent to his family.

Dr. Theo. Menges.

Dr. Menges was born in Bristol, Ind., May 2, 1854, and died at Chicago, Ill., after a brief illness, June 1, 1900.

Dr. Menges's career as a dentist and in connection with this Association was comparatively brief, occupying only some four or five years. He was a man of great energy and persistence in whatever he undertook, so that he did for the profession, chiefly in the conduct of one of its educational institutions, in his few years what very few would do in a lifetime. Whatever he undertook received his undivided attention, and his determination was to make a success, and this he accomplished.

He was largely instrumental in building up and establishing the American College of Dental Surgery in the few years of his connection with it. He possessed an unusual power of organization. His insight was very marked, and his ability to reach into the future was far above the ordinary. He made his influence felt in a very decided manner throughout the entire profession of his country.

In view of what he was, his unusual ability, integrity, and honesty of purpose,

Resolved, That in Dr. Menges this Association has lost an able and honored member, one in whom there was great promise for the work of this body as well as for the profession; and that we recognize the value of his life-work as a scientific investigator and organizer and his earnest efforts to improve the educational conditions of dentistry in this country. His death will be regarded by all as a loss to the profession, and especially to its educational interests.

Resolved, That a copy of this statement, in proper form, be sent to his family.

Dr. Wm. T. Arrington.

Dr. Arrington died at his home, in Memphis, of typhoid fever, April 26, 1900, in his sixty-fourth year.

He was born at Dresden, W. Tenn., November 11, 1836. His boyhood days were spent on a farm in that neighborhood. On coming to manhood he entered upon the drug business in Dresden, and continued in that for two or three years. During this time he devoted himself, as opportunity offered, to the study of medicine, with a view to making that his profession. After some three or four years his health failed, and he changed his residence, going to his brother, Dr. B. F. Arrington, in North Carolina, where,

under the instruction of his brother, he resumed the study of medicine, and also gave some attention to dentistry. The latter finally engrossed his whole attention. In 1854 he entered the Philadelphia College of Dental Surgery, where he graduated in 1856. He took up the practice of dentistry in Trenton, Tenn., and attained excellent success.

He was quartermaster in the Confederate army for about two years. His health again failing, he returned to his old home, Dresden, occupying himself upon the farm.

After two years here he resumed the practice of his profession, locating in Memphis, Tenn. Here he attained a large practice. He was one of the organizers of the Southern Dental Association, and was its President in 1869. He was professor of prosthetic dentistry in the Ohio College of Dental Surgery for one year, where he acquitted himself with honor, showing himself to be a good teacher.

Dr. Arrington was a power for good, especially throughout the South, where he was highly esteemed. He was of a social nature, and was a friend to those worthy of his regard.

Dr. Arrington married Miss Emma C. Levy, of Trenton, Tenn., January, 1859. He leaves a wife and two sons, well-known citizens in Memphis.

Dr. Wm. H. Marshall.

Dr. Marshall died at his home, at Little Rock, Ark., in his fifty-ninth year, September 21, 1899.

In the death of Dr. Marshall the entire profession, and especially that of the southern part of our country, loses a distinguished and beloved member. He was a son of Dr. Hammond Marshall. His birthplace was Pittsburg, Pa. After attaining manhood he entered the Confederate service, and was with the army during the entire period of the civil war. In 1876 he began the study of dentistry with his father, and in 1870 began practice at Oxford, Miss. Subsequent to this he took a course in the Philadelphia Dental College, and graduated in 1880. Dr. Marshall had great love for his profession; was interested in maintaining a high standing; was a member of the Southern Dental Association, and of the State Dental Society of Arkansas; also a member of the State Board of Examiners of the State of his residence.

Dr. Marshall's was a noble character, presenting an admirable combination of strength and gentleness. He was a man universally beloved. His life was full of kind deeds. His love for others led him to grant aid wherever he found it was truly merited. His beneficiaries can be numbered by the score. In 1865 he married, at Oxford, Miss., Mary McCorkle. She and three children survive him. Dr. Marshall's death brought sorrow to all who knew him.

Resolved, That this statement, properly prepared, be sent to his family, and also placed on the memorial page of the Transactions of this body.

Dr. W. W. H. Thackston.

The subject of this notice died at his home, in Farmville, Va., December 8, 1899, of heart failure, in his eightieth year.

He was born in Charlotte county, W. Va., February 9, 1820. He moved to Farmville in 1833, where he resided till his death. He graduated in 1842 from the Baltimore College of Dental Surgery. He was a member of the second graduating class of the oldest dental college, and at the time of his death was the oldest graduate of dentistry in the world.

Dr. Thackston was a splendid specimen of physical manhood, and of commanding presence.

He was a man of strong intellectual ability. His loyalty to his profession was of a high order, and in a marked manner he left his impress upon his profession.

He was often called to the position of presiding officer in his profession as well as elsewhere, and this because of his eminent fitness for such work. While he was very devoted to his profession, and did much for the maintenance of its honor and elevation, yet he was active in other spheres of life. He was closely identified with the interest, material and moral, of the community in which he lived, and as a result of this he held positions of honor and trust for a large share of the years of his active life. He was a warm and ardent friend; one whose friendship was ever an inspiration. What he did for his profession and in other departments of life-work was done from a pure, unselfish motive. The influence of that which he did does not pass away with him, but will run on through time, and will endure as long as the profession with which he was so intimately connected remains.

His death is a great loss to the profession with which he was so long identified. It can ill afford to spare such as he.

The whole profession would do well to emulate his example.

He was married July 16, 1848, to Miss Mary E. Fowks, of Amelia county, Va., who died about sixteen years ago. Three children, two sons and a daughter, survive him.

Resolved, That a copy of this statement, properly prepared, be sent to his family, and placed upon the records of this Association.

J. TAFT,
EDWARD S. GAYLORD,
WALDO E. BOARDMAN,
Committee.

On motion, the Association adjourned.

A. H. PECK, *Recording Secretary.*

Minutes of the Executive Council.

TUESDAY, JULY 10, 1900.

The Executive Council met in Room T, Hotel Chamberlin, and was called to order by the President, Dr. B. Holly Smith, at 10.15 o'clock A.M.

The President requested Dr. H. J. Burkhart to preside at subsequent meetings.

On motion, it was voted to recommend to the Association that the action of the Executive Council in changing date of meeting be ratified.

That Dr. A. H. Peck act as Recording Secretary in the place of Dr. Geo. H. Cushing, deceased.

It was voted to grant a hearing at 4 o'clock on the proposed repeal of that part of the standing resolutions requiring the Executive Committee to obtain from the Chairmen of Sections a list of the essayists and their subjects sixty days prior to time for annual meeting.

It was voted that the evening session of the Association shall begin at 8 o'clock, and that the first Section to be called is Section III.

On motion, Council adjourned to meet at 4 P.M.

Tuesday afternoon session was called to order at 4 o'clock by Dr. H. J. Burkhart.

Dr. C. S. Butler presented a report on behalf of the joint Committee on Essays.

Report of the Committee on Essays.

MR. PRESIDENT AND GENTLEMEN: Your Committee on Essays begs to report that a full meeting of the committee was held yesterday, in accordance with our By-laws, and a large number of papers from the various Sections examined, some of which are recommended to be read before the general body, the others referred back to the Sections.

The value and importance of this committee is clearly demonstrated in that it prevents the presentation before the Association of papers of insufficient importance to be read.

Respectfully submitted,

CHAS. S. BUTLER, *Chairman.*

Dr. Richard Grady was granted time to present resolutions and to explain in regard to the co-operation of public schools in dental teaching.

Resolved, That a special committee of five (5) be appointed by the President to consider the expediency of inaugurating steps looking to the co-operation of the public schools in teaching "Good Teeth, Good Health."

Resolved, That said committee report the result of its deliberations to this Association at the earliest practicable moment.

It was voted to recommend the appointment of a committee of five to act in accord with the resolutions presented by Dr. Grady.

The Secretary read a communication from the Committee on Army and Navy Dental Legislation.

Report of the Committee on Army and Navy Dental Legislation.

TO THE OFFICERS AND MEMBERS OF THE NATIONAL DENTAL ASSOCIATION: In obedience to the letter and spirit of your instructions, your Committee on Army and Navy Dental Surgeon Legislation immediately began a most searching investigation of the conditions involved and the difficulties to be confronted in working out the problem assigned us.

All the members of the "Committee at Large to act in accord with the present one" and sundry other persons were addressed personally or by mail with reference to the plan of work and the provisions of the bill to be proposed.

In no other part of the work of this committee were there involved such apparently insurmountable difficulties as the drawing of a bill the terms of which should be acceptable as a fair and reasonable basis for harmonizing the widely diverging views known to obtain among members of Congress, among officers of the medical and other departments of the army, and among members of the medical and dental professions.

It was therefore to the success-hazarding terms and provisions of the bill itself (the bill since known as H. R. 972, and Senate 4044) that we, from the various view-points referred to, gave the most impartial study and thoughtful consideration of which we are capable, and it was with pleasure, and we trust pardonable pride, that we saw this most important feature of our work formally approved by the War Department; advocated by Surgeon-General George M. Sternberg and other prominent staff and line officers of the army; unanimously recommended by the House Military Committee; indorsed by a large majority of the members of Congress, and supported with more or less zeal by the representative members of our profession.

But it must not be thought for a moment that the favors bestowed on this bill and the interests it represents came as free as the air and refreshing showers to the lily that neither toils nor spins. Far from it. There was no objection, real or imaginary, that was not raised in some quarter and met by the tedious and painstaking gathering of sufficiently convincing evidence. In the prosecution of this work, which was begun months before Congress met and urgently pressed to its closing hour, your committee issued fifty-five hundred circular letters and five hundred thirty-page pamphlets, and the correspondence included about fifteen hundred hand-written and five hundred typewritten letters. The hours given to personal attention to the work by the Secretary of this committee equaled, if it did not exceed, the number of hours spent by Congress in open sessions from December 4 to June 7.

There are no data available of the work done by members of the profession generally. It is a matter of regret that we cannot report

fully the work of the members of the Committee at Large, and of others in the profession who responded to calls for assistance. We must be content, until the work is complete, in stating that several visited Washington at their own expense, while others, to the number of about one hundred, rendered effective service from their homes. Almost every member of the Senate and House was importuned; many more than once, and a few from ten to fifty times, the policy being to continue appealing from different sources with pertinent facts until active support was won or until opposition was silenced.

The bill, which passed the Senate with an amendment limiting the whole number of army dental surgeons to thirty, now lies on the Speaker's table, and will have the same status at the opening of the next session of the present Congress. With the favor which the measure has won, and with continued support, we ought to secure its passage before the close of the next session.

In regard to the navy. We respectfully report that Surgeon-General Van Reypen was called upon twice in the hope that he would make recommendation to Congress for authority to appoint a small number, say eighteen or twenty, of well-qualified dental surgeons to care for the mouths and teeth of the boys in the training schools, and for assignment to such stations as would render their service occasionally available to the officers and enlisted men of the navy and marine corps. While acknowledging the need of and a desire for such service, and promising to accept our proffer of the influence of the dental profession in support of such recommendation should he conclude to make it, there was nothing more accomplished than the occasional voluntary indorsement of a Senator or Representative of such a bill for the navy as we advocated for the army.

With the recommendation of the Navy Department it would be easy to secure legislation that would supply the navy's need in the premises.

We recommend the continuance on the part of the dental profession of such effort as will make more apparent, from both the humane and the economic standpoints, the duty of the Government to supply through the respective medical departments a service alike amply and equally sufficient for the timely and suitable treatment of each and every disease or disorder which affects the health,

efficiency, martial spirit, physical endurance, and pensionable status of all our country's defenders on both land and sea.

Respectfully and fraternally submitted,

M. F. FINLEY, *Chairman;*
C. S. BUTLER,
WMS. DONNALLY, *Secretary.*

On motion, it was directed that the communication be read before the Association by the Secretary.

On motion, it was directed that an order be drawn on the Treasurer for $345.30 to defray expenses incurred by above committee.

The communication presented by Dr. R. Ottolengui regarding interstate legislation was, on motion, ordered read by the doctor to the Association.

Report of Committee on State Interchange of License.

MR. PRESIDENT AND GENTLEMEN: About a month ago our President notified me that in the absence of Dr. Bryan, the Chairman of this committee, he would expect a report from me. Not having anticipated this call, I had not especially done any work toward the preparation of a committee report, but as a member of the committee I have during the year kept this subject prominently in mind, and am familiar with what has been published relating thereto. Upon receipt of the notification from the President I therefore immediately followed such a course as would in some measure enable me to present in a concrete manner some proposition based on the views of all especially interested throughout the country. I sent a letter to the secretaries of all the State Examining Boards, and also to the deans of all the dental colleges; in all about one hundred letters.

In this communication I solicited views, first, on the proposition of Dr. Bryan that we should attempt to obtain national legislation;

second, upon a proposition looking toward unification of State examinations, to the ultimate end that interchange of license might be more readily and justly obtainable. The plan formulated established a National Board of Examiners, equal in numbers to the States represented, one member to be a resident of each State; two-fifths of these were to be appointed by the National Association of Dental Faculties, two-fifths by the National Association of Dental Examiners, and one-fifth by the National Dental Association. This board was to formulate examination questions and methods to be uniformly followed in all the States. Examination to be entirely voluntary, and the successful candidate to receive a certificate attesting professional attainment signed by the National Board. This certificate of course would have no legal value at the outset, but the several States parties to the agreement would undertake to amend their dental laws, so as to permit the State Boards to license holders of these national certificates without further examinations.

The third inquiry was in relation to the possibility of amending State laws so as to make it possible to accept licenses from other states, unless such power already existed.

I have received responses from twenty-two States; in all twenty-seven letters, of which sixteen are signed by the deans of colleges. These letters make a valuable contribution to a discussion of this subject, and I believe that they should be published in our Transactions for reference; but, with one exception, it does not seem best to take up the time of the Association by reading them now. They are therefore simply filed with this report for such disposition as the Association may direct. I wish the writers, however, as well as our members, to understand that the plan to be presented as the present view of your committee is directly based upon the views expressed by those who have taken the time to write to me. There is one communication which I will read; not because the writer deserves the honor, but that this Association, and especially the members from the State of Illinois, may know the attitude of at least one dean toward this, the representative body of the dentists of the United States.

I have to acknowledge the receipt of your letter, in which you state that you are on a committee to consider means of procuring interchange of State licenses. I must confess that I admire your temerity to address me, after trying your best to defile me and the institution I represent; but

as this is one of the peculiarities of your race, I suppose I got to put up with it, especially as it is my conviction that anything appertaining to the above subject should be discussed with the devil himself, if it would further the subject.

Before I enter upon the subject proper, I will say that twenty-five to thirty years from now, when I hope the majority of the dental profession will consist of, first, men; and, second, such that can think logically, and not of the offal of divers professions and trades. It will bring a smile to the face of the then dental profession to read the history of the dental profession at the present time, and the pickaninny acumen displayed by the self-constituted leaders of the dental profession at the present day.

My friend (as I am proud to say) Dr. Edgar D. Swain, did propose, years ago, to amend the Illinois dental law in such a manner that holders of licenses of other States should be entitled to a license to practice dentistry in this State without further examination. I and several others of Dr. Swain's friends supported his motion, but the thoughtless rabble of the profession cried: "Then we will have every dentist in the United States come to Chicago," although nothing of the kind would happen, as little as I would change my abode from Chicago, after practicing here for over thirty-five years. The objectors to the above proposition showed their smallness of thinking in an eclatant manner. Such a law might bring some of the profession to Chicago, but as it would also give some of our dentists a chance to practice somewhere else, no harm would be done.

I would fight any law which would give the examination of candidates for licenses to practice dentistry into the hands of members of the so-called National Association of Dental Faculties. These men are the bane of the dental profession. Under the guise of furthering the interests of the dental profession, they aspire to conditions as we find them in Austria and Italy to-day, where the worst dentists, barring China, perhaps, can be found, although I would like to say because each dental practitioner has to be a graduate of medicine before he can procure a license to practice dentistry, and a person will become twenty-four years old before he can procure the M.D. handle to his name; and I further contend that this is too late for a man to start the study of dentistry, which demands, first of all, manual dexterity, as dentistry will never be a science, but at the most, a scientific art. The laws of Austria and Italy have a great charm for "de mortibus nihil nise bonibum," and men of his scientific attainments, because the so-called dentists and M.D.'s of these countries hire men without any but a mechanical dental education, and are permitted to let these empiricers attend to their practice alone, while they spend the biggest part of the earnings of these empiricers in some watering place, etc., far, far away from their domicile, where the "assistant" is allowed money for them, under the protection of the M.D.'s sign. All the national dental associations I have visited—and these are quite a few—have convinced me that they do not represent the dental profession as a whole, but consist of the lantern-jawed, foghorn-voiced members of the

dental profession who imagine that they represent it, and that on their knowledge (or ignorance) the future of the profession is based. They form a mutual admiration society *par excellence,* where harmony prevails as long as every member's vanity is duly flattered.

I will indorse any Board of Examiners consisting of members from divers States, and of dentists who have a large practice and never belonged to any mutual admiration society. They are the men who will know what a practitioner of dentistry ought to know, who wishes to practice the dental profession in the United States, and the majority of such a board would not be swerved by any idiosyncratic notions and ideas as little as their insatiate greed for pecuniary profit, which is the guiding star of all our lumen in the National Association of Dental Faculties.

FRITZ W. HUXMANN, *Dean,*
German-American Dental College,
Chicago, Ill.

B.—The Illinois State Board of Dental Examiners has reiterated the recognition of the German-American Dental College by a unanimous vote on Monday, June 18, 1900.

I especially commend this letter to the attention of the National Association of Dental Examiners, which body appointed a committee last year to investigate the relations existing between this institution of learning and the Illinois State Board of Examiners, which latter body, according to the postscript, has just indorsed this college.

From the letters received, and from my personal study of the subject, Dr. Bryan's hope for a national law regulating the practice of dentistry cannot be realized. Whatever the constitution of the Republic of Switzerland may be, in which country a national dental act has been passed, the Constitution of the United States is such that no law of this character could be passed and become operative without an amendment to the Constitution. It is a fundamental principle of our Constitution that the States are guaranteed what is called State's sovereignty. The central government, therefore, cannot interfere with the policing of any State, and laws governing the practice of dentistry come within the police regulation of the States. Were it not true, as I have stated, that the central government is restricted from interfering in the affairs of the residents of the several States, we would long ago have had United States laws regulating marriage and divorce, the bestowal of property by will, the punishment of crimes, and many other

matters in relation to which State laws are at present widely divergent.

In view of this irrefutable fact, it is the opinion of your committee that much time and needless discussion will be saved if the idea of a national law relating to dentistry be abandoned.

Is there, then, any other means of accomplishing the much-desired end?

The second proposition advanced by your committee, that involving a National Board of Examiners, is but an idea evolved from many suggestions of a similar nature which have come from many sources at different times. It is not on the whole well considered by those who have expressed themselves to your committee, though a few have sent in favorable views. The main objection, which is probably a valid one, is that however attractive theoretically, in operation it would prove impracticable; partly because of the size of the committee, partly because of its wide distribution, and for other reasons. Nevertheless, there is a side of this subject which has been heretofore little considered, which would nevertheless intrude itself into any final consideration of a plan of State interchange of license. The State Boards of Examiners have been sanctioned by the Legislatures as a protection against incompetently-managed colleges. The States have the same right to guard their citizens against the possibly incompetent Examining Boards of other States. Just as they have questioned the standards of the colleges granting diplomas, so may they also inquire into the standards of the boards granting licenses. It therefore logically follows that if interchange of license is to be justly obtained, it will be necessary to formulate a plan for uniformity of standards of examinations in the States agreeing to accept licenses from one another.

In this connection I quote from the letter of Dr. J. R. Thompson, Secretary of the Examining Board of South Carolina, who says that though his board could probably get authority to accept the licenses of other States, he doubts whether the board would advocate such a law, having lost faith in Examining Boards since "the exposure of answers to questions before State Boards given by some graduates."

In reply to the query as to whether amendment to State laws could be obtained which would permit the acceptance of licenses

from other States, I have affirmative replies from correspondents in the following States,—viz, Alabama, California, Colorado, Washington, D. C., Georgia, Massachusetts, South Carolina, and Tennessee. In Indiana, Maryland, Louisiana, and North Dakota the laws already permit such interchange.

Your committee has the honor to offer the following plan for the early establishment of interchange of State license:

First, an interchange of licenses between those States exacting the highest educational requirements. Under present laws it is possible that this class would include New York, New Jersey, Pennsylvania, and Michigan. There is, however, an element of doubt in relation to the status of interchange in these States, mainly because of the stringency of the New York law, whose requirements are thus stated in Bulletin No. 9 of the College Department of the University of the State of New York, recently published under the direction of Mr. James Russell Parsons, Jr., Secretary of the Regents of the State of New York:

"The applicant must furnish evidence that he has a general education equivalent to a full high school course, and he must have received a degree from a registered dental school or a medical degree with a special one-year course in a dental school, or a foreign diploma from some registered authority."

New York has already agreed to interchange of license with the State of New Jersey, but this is based upon an interpretation of the New Jersey law made by the New Jersey Board, which interpretation would probably not be sustained by the courts if resisted by an applicant for license in that State. The subject is touched on on page 753 of the "Bulletin" referred to above, where it is stated that the New Jersey statute demands "a preliminary education equal to that furnished by the common schools."

The New Jersey commission construe this to mean "graduation from a high school," and on this representation interchange of license has been granted. It is very doubtful, however, that this position is legally correct, as high schools are not a part of the common school system throughout the State, being situated only in a few large cities. A citizen from a smaller community in New Jersey, having obtained the full common school education of his locality, and having a diploma from a dental college whose pre-

liminary requirements did not debar him, could probably demand an examination for license from the State Board, and obtain it by order of a court if refused. However, until the construction of the law maintained by the New Jersey commission is upset, the interchange of license with New York will continue. The application of Pennsylvania for interchange with these two States is under consideration. The recent action of the University of Michigan in elevating its preliminary requirements to the equivalent of high school graduation makes that State a possible candidate for admission into the license agreement with the three States named, though some alteration of their State law would be required before they could be accepted under the laws of New York.

The second feature of your committee's plan would establish an agreement as to interchange of license between those States which require college graduation as a prerequisite to examination for license. Under this agreement would be included Colorado, Florida, Delaware, Georgia, Kansas, Maryland, Oregon, Wyoming, Washington, Minnesota, and Connecticut. Washington and Connecticut have features of their laws which would probably need alteration before they could be included in this agreement. Connecticut examines practitioners of three years, and Washington those in practice ten years. A similar clause is in the Minnesota law, but, as it reads "ten years prior to 1889," it could well be overlooked.

Thus in the second class we would have eleven States that might agree not only to accept the licenses of the States in this class, but also the licenses of those States in the first class,—viz, New York, New Jersey, Pennsylvania, and Michigan.

Lastly, the States not included in either of these agreements might accept the licenses of any of these fifteen States. What would be the inevitable result of such a procedure?

First, there could be established within a very few years an interchange of licenses between a large number of States on an equitable basis. Second, we would find that the eleven States which accepted the licenses of the four States exacting higher standards, realizing that they were giving where they were not receiving, would as rapidly as possible undertake to elevate their standards so that they might obtain recognition from the States of

the first class. In similar manner the States of lower requirements finding that dentists from other States might come to them while their own men were obliged to remain within their own borders, would amend their laws so as to require college graduation as a requisite for license, which would entitle them to admission into the interstate agreement of the States of the second class.

Two features of this plan are respectfully emphasized: First, that it offers a scheme for interchange of license which does not demand any elaborate change of existing statutes, and which, therefore, might be realized in the near future. Secondly, that, while establishing interchange of license, the plan exerts a moral and political influence toward higher education.

In conclusion, your committee would respectfully state that the work of preparing this report has been undertaken at the request of our President, in the midst of the busiest part of the year, and at a cost of considerable time and labor, in the belief that this Association when it appointed this committee did so with an earnest intention to accomplish something, and not merely to invite an academic dissertation upon a subject which has been discussed already too long with little practical result. Your committee cannot insist that the plan offered must necessarily receive the approval of the Association, but if in the discussion or by other means no better plan be brought forward, your committee respectfully hopes that the Association will indorse the plan and recommend its consideration to the State Societies and the dentists of the States interested, as well as to the National Association of Dental Examiners and the Examining Boards throughout the country.

Respectfully submitted,

R. OTTOLENGUI.

It was voted that the Council should meet at 8.30 o'clock Wednesday morning, and that the Wednesday morning session of the Association should convene at 9 o'clock.

On motion, Council adjourned.

Wednesday morning session was called to order by Dr. H. J. Burkhart at 8.30 o'clock.

Dr. Charles McManus, Chairman of the Committee on History, presented his report.

Report of Committee on History.

SECOND REPORT.

THE Committee on History has the honor to report that a continued effort is being made to collect material for the proposed history of dentistry in this country, and to interest members of the profession generally in the subject. It is not necessary at this meeting to take up any valuable time in the consideration of the at present rather meager data.

Last year, on account of a program crowded with papers of a more interesting and practical nature, and owing to the fact that the preliminary report was of such a formidable bulk as to cause mild consternation, it was only read in part.

Your committee had hoped that this preliminary report might have obtained some publicity through the dental journals, as this would have greatly aided the work of the committee; but, again, probably on account of weight and bulk, it was not printed at all, except in the Transactions, where it reposes in a sort of dignified seclusion far from the eyes of men.

Therefore, your committee would call the attention of the Executive Council to one suggestion in that report: "*That said committee be composed of not less than five* or, if limited, more than ten members, thoroughly interested in this subject. . . . That said committee be authorized to invite, when it is deemed for the good of the work to do so, certain distinguished members of the dental profession interested in historical matters to be 'advisory members.' "

The present committee (of three) is altogether too small to handle this work in any proper manner, and, as the question of expense must be a feature of work in the future, the committee should be

enlarged so as to share such responsibilities. Another member in the West and one in the city of Washington would seem absolutely necessary.

In the report last year it was stated that "the general subject of the preparation of a dental history should be brought forward and considered as a matter of importance at the meeting of the International Dental Congress at Paris in 1900." We are glad to say that the matter will come up under Section VII, sub-section A, "Histoire de l'Art Dentaire: Musées," and that papers will be read by Dr. Jonathan Taft, on "History of Dentistry"; by Dr. Lemerle, of Paris, President of the Section, on "Histoire Générale de l'Art Dentaire"; by Drs. Ottofy, Charpentier, and others. Dr. Gordon White will represent your committee at the Congress.

In the President's address yesterday it was suggested that lectures on conduct of practice, ethics, etc., should be given to the senior classes in dental colleges. Your committee considers that it would be well if every senior class had delivered to them a few lectures on the history of the dental profession.

In the future, although the Committee on History should be a distinct and permanent committee, it could report through Section II, Dental Education, Literature, Nomenclature, Histology, and Microscopy.

All of which is respectfully submitted.

CHARLES MCMANUS, *Chairman.*

On motion, it was decided to recommend that two additional members be appointed on this committee.

Dr. J. D. Patterson, on behalf of the Committee on Ethics, presented a verbal report regarding the newspaper article ascribed to Dr. R. Ottolengui.

On motion, Dr. Patterson was requested to present the matter to the Association.

Dr. C. N. Johnson, on behalf of the Committee on President's Address, presented his report.

Report of Committee on President's Address.

TO THE MEMBERS OF THE NATIONAL DENTAL ASSOCIATION:

Your committee have the honor to report that we fully concur with the President's suggestion regarding the support which should be given the National Association by the Faculties and Examiners Associations, and particularly the State organizations. These in the past have not taken the earnest interest which they might and should have taken toward increasing the membership. This is especially true of delegate membership.

We most heartily and emphatically indorse the President's suggestions in regard to the acceptance of associate memberships delegated from foreign societies.

We concur with the suggestion to the Paris Congress Committee in regard to a conference at the International Dental Congress at Paris next August leading to closer affiliation among the various dental organizations of the world. We would also venture to urge upon this committee the necessity of earnest work in this direction on this most opportune occasion.

We believe that the President's recommendation regarding the appointment of commissions by the various Sections for the purpose of systematizing and crystallizing the thoughts and methods of the profession up to date is most practical and feasible, and we thoroughly indorse his suggestion and ask that a committee be appointed to carry out this idea.

We respectfully ask the Association to carefully consider the question of the Surgeon-General's intimation that this Association suggest candidates for appointment as examining dental surgeons under the proposed law, and the committee feels that the power to recommend resides with the Executive Council.

We indorse all the President has said on the subject of a proposed history of dentistry, and concur in his recommendation as to the continuance of the present committee and its enlargement. The suggested vote of thanks will be more effective and appreciated if the members of the Association and profession will awaken to the necessity of active and earnest effort in assisting the committee in collecting the necessary data to make a history what it should be,

—one of facts. The co-operation of the dental magazines in publishing the preliminary reports will aid most effectually the work of the committee, and it would seem to be the duty of the editors and publishers of these journals to further this work in every manner possible. This preliminary work should be advanced rapidly before the final passing away of all the pioneers.

With regard to the establishment of a scientific bureau, it is the sentiment of the committee that if the idea of the Sectional commissions be fully carried out it will adequately cover the ground.

Respectfully submitted,

C. N. JOHNSON,
JAS. MCMANUS,
THOMAS T. MOORE,
Committee.

On motion, Council adjourned to meet at 3 o'clock P.M.

Afternoon session was called to order at 3 o'clock; Dr. H J. Burkhart in the chair.

The annual report of the Treasurer, Dr. Henry W. Morgan, which had been audited by the Executive Committee, was received and placed on file.

Treasurer's Report.

Receipts for 1900.

Balance on hand August 1, 1899	$1,054.72	
Dues paid at Niagara and collected since	1,380.00	
		$2,434.72

Disbursements.

Salary Recording Secretary	$300.00
" Assistant Secretary	100.00
" Treasurer	100.00
Official stenographer	125.00
Postage, stationery, printing and distributing Transactions	212.67
Committee on Appointment of Dentists in Army and Navy	242.20
Executive Committee	129.35
Section Work	57.90
Local Executive Committee	35.00
Publication Committee	18.00

Historical Committee	$14.45	
Dues returned	5.00	
		$1,339.57
Balance on hand	1,095.15	
		$2,434.72

Respectfully submitted,

HENRY W. MORGAN, *Treasurer.*

Approved July 11, 1900:

V. H. JACKSON,
J. D. PATTERSON,
T. S. WATERS.

Dr. C. N. Johnson presented the following recommendation:

That the Committee on Army Dental Surgeon bill be empowered to draw on the Treasurer for a sum not to exceed $250, for the work of the committee for the coming year.

That a committee of five members of this Association be appointed on ways and means for the furtherance of this work.

On motion, the communication was recommended adopted by the Association.

The various amendments to the Constitution and By-Laws, as proposed at the meeting of 1899, were, by vote, recommended adopted, except that proposing the abolishment of the Executive Council, which was recommended rejected.

On motion, Council adjourned to meet Thursday morning at 8.30 o'clock.

Thursday morning session was called to order by Dr. H. J. Burkhart at 8.45 o'clock.

Report of Section I was read.

Report of Secretary of Section I.

SECTION I would report that five papers were received, as follows: "Art in Prosthetic Dentistrv," Dr. Mary E. Gallup, Boston; "The Mechanical Fixation of Teeth Impaired by Disease," Dr. F. G. Gregory, Newark, N. J.; "A System of Removable Bridge-Work," Dr. W. E. Griswold, Denver, accompanied by

diagrams; "Mechanics as Related to Dentistry," Dr. W. Storer How, Philadelphia; "Ideal Crown- and Bridge-Work," Dr. Nelson T. Shields.

As per Constitution, these were referred to the joint committee, which referred them back to the Section, recommending that the paper by Dr. Mary E. Gallup be read before the general meeting. The rest of the papers as mentioned were read before the Section, and it was recommended that they be read before the general meeting if there is time, and if not, that they be referred to the Publication Committee.

The paper of Dr. Griswold, as well as that of Dr. Shields, is accompanied by models and apparatus, which were recommended and referred to Section VI to be used as demonstrative clinics.

On motion of Dr. Ottolengui, it was resolved that all operations including the use of porcelain art, belonged to Section I.

It was resolved that it was the sense of Section I that the word "prosthodontia" be adopted to indicate all operations included under the present terms "mechanical" or "prosthetic" dentistry, and that the adoption of this word formally by the National Association be recommended.

WM. ERNEST WALKER, *Secretary.*

Section III objected to the resolution contained in the report of Section I, to the effect that porcelain inlay work should be placed in Section I.

On motion, it was directed that porcelain inlay work should remain in Section III.

The Chairman of Section III recommended that one committeeman be appointed from each State to co-operate with the chairmen of the various Sections, with the view of furthering the interests of the Association.

On motion, Dr. Weeks was instructed to confer with the Committee on President's Address in regard to this matter.

On motion, it was decided that the afternoon should be devoted to clinics, the report of same to be presented at the evening session.

Dr. Hinman, Chairman of the Committee on Clinics, requested

that it be recommended that Dr. Black be granted ten minutes during the morning session in which to explain the use of his instrument, called the manu-dynamometer.

On motion, it was decided that the expression "mechanical dentistry" should not be substituted by any other.

On motion, Council adjourned to meet at 3 P.M.

Thursday P.M. session was called to order by Dr. Burkhart at 3 o'clock.

The annual report of the Recording Secretary, which had been audited by the committee, was accepted.

To the Auditing Committee of the National Dental Association:

GENTLEMEN:—The Recording Secretary of the Association respectfully submits the following report:

At the close of the meeting of 1899, under the direction of the late Secretary, Dr. George H. Cushing, I communicated with the members of the Association, with the view of determining to which Section they wished to be assigned. I also performed various other duties during the year, under the direction of Dr. Cushing.

The books, papers, etc., that it has been possible thus far to obtain were sent to Dr. J. N. Crouse, Chairman of the Executive Committee, immediately after the death of Dr. Cushing. Dr. Crouse turned them over to me.

Respectfully,

A. H. PECK, *Rec. Sec'y.*

The annual report of the Corresponding Secretary was read, and, on motion, was accepted.

Gentlemen of the National Dental Association:

Your Corresponding Secretary has answered all letters received and sent notices as required.

The New York Public Library acknowledged receipt of copy of Transactions of this body for 1899, with thanks.

Cordial invitations to hold our next meeting in their respective cities have been received from business organizations in Chicago, Milwaukee, Cincinnati and Niagara Falls.

Respectfully submitted,

EMMA EAMES CHASE, *Cor. Sec'y.*

A letter from Dr. J. Adams Bishop, in which he tendered his resignation, was read. On motion, it was directed that his resignation be accepted when his dues were paid.

A communication from Dr. G. Lenox Curtis, in which he tendered his resignation, was read. On motion, the resignation was accepted.

A communication from Mr. Hise, on behalf of The S. S. White Dental Mfg. Co., to the effect that they would publish the Transactions on same terms as they had previously done, was read. On motion, the terms were accepted.

The following resolutions regarding Dr. J. N. Crouse and the Dental Protective Association were read by the Secretary:

Resolved, That in view of the recent activity of the International Tooth Crown Company and their agents and allies, the National Dental Association, in third annual meeting assembled, wishes at this time to again put on record its confidence in and loyalty to the Dental Protective Association and its management.

Resolved, That we express anew our loyalty to Dr. Crouse and extend to him our hearty appreciation of and confidence in his work as Chairman of that association.

Resolved, That this Association considers the cause of the Dental Protective Association the cause of the profession, and it condems as inimical to the interests of the entire profession the circulation of slanders and the publication of articles calculated to weaken the hands of those who are fighting our battles, and to put weapons into the hands of our enemies.

On motion, the adoption of the resolutions by the Association was recommended.

On motion, the verbal report of Dr. Crouse, President of the Dental Protective Association, which was accompanied by the books of the association,—which latter were examined and found correct,—was accepted.

The following resolution, presented by Section III, was, on motion, adopted:

Resolved, By Section III, that it is requested that members having appliances or instruments shall report same to the Chairman of the Clinic Committee at the opening of the first session, and before exhibiting them otherwise.

JOHN I. HART, *Sec'y.*

On motion, it was recommended that the election of officers be made special order for 10 o'clock P.M.

On motion, Council adjourned to meet at 7 o'clock P.M.

Thursday evening session was called to order by Dr. Burkhart at 7.30 P.M.

Dr. Patterson made a report on behalf of the Executive Committee of bills, etc., which was placed on file.

On motion, it was decided that the estate of the late Dr. Cushing should be paid $200; also that Dr. Peck should be paid a like amount for services as Recording Secretary during the past year.

Dr. Patterson, on behalf of the Committee on Credentials, presented the following report, and recommended that the charges therein be dismissed:

To the Executive Council of the National Dental Association:

Your committee hereby reports that charges of unprofessional conduct have been made against Dr. J. N. Crouse by Dr. H. A. Parr.

Your committee recommends that no action can be taken, on account of the fact that the charges are not accompanied by sufficient proof.

V. H. JACKSON,
J. D. PATTERSON,
T. S. WATERS,
Committee on Credentials.

On motion, the recommendation was accepted, and the charges were recommended dismissed by the Association.

The following report of the committee appointed to formulate a scheme to form a commission according to the suggestions in the President's address was read:

We beg leave to present the following as a preliminary report. We would recommend that each Section appoint a commission to consist of the Chairman and Secretary, together with three other members of the Section, whose duty it shall be, upon the adjournment of this body, throughout the year to make original investigation upon any given subject pertaining to the Section, and examine the literature upon said subject, both general and periodical, so as to crystallize the present thought of the profession and bring it to date.

The committee would also recommend that in the prosecution of original research to be presented to this body, the expense of such investigation be borne by the Association, and that the authority to decide as to

the originality of any work offered shall rest with the commission of each Section. The committee would offer the following resolution:

Resolved, That the Sections immediately organize and form the commissions as outlined in the foregoing recommendations.

JAMES TRUMAN,
CHAS. S. BUTLER,
C. N. JOHNSON, *Committee.*

On motion, the report was adopted.

On motion, it was recommended that an order be drawn on the Treasurer for $400 in favor of Dr. Donnally for personal expenses incurred by him in connection with the army and navy bill.

The following report of the Publication Committee was read, and, on motion, was adopted:

The Publication Committee respectfully offers the following report:

The Executive Committee made the usual arrangements with The S. S. White Dental Mfg. Co. for the printing and distribution of the Transactions, and under Mr. Hise's supervision they were produced in the usual admirable manner. They were distributed about April 10, 1900. They have been forwarded, as usual, to those entitled to receive them, *i. e.*, to members who were not in arrears; to various libraries, and to honorary members. There are on hand at the present time about fifty copies.

Expenditures.

For stationery, copying, and postage..... $18.00

Credit.

By amount received from Treasurer..... $18.00

C. N. JOHNSON,
A. W. HARLAN, *Committee.*

Found correct:

V. H. JACKSON,
J. D. PATTERSON,
T. S. WATERS, *Auditing Committee.*

July 12, 1900.

On motion, the Council adjourned.

A. H. PECK, *Recording Secretary.*

APPENDIX.

EX-PRESIDENTS OF THE AMERICAN DENTAL ASSOCIATION.

1859*	W. W. ALLPORT	Chicago, Ill.
1860	W. H. ATKINSON	Cleveland, Ohio.
1861	No meeting.	
1862	GEORGE WATT	Xenia, Ohio.
1863	W. H. ALLEN	New York, N. Y.
1864	J. H. MCQUILLEN	Philadelphia, Pa.
1865	C. W. SPALDING	St. Louis, Mo.
1866	C. P. FITCH	New York, N. Y.
1867	A. LAWRENCE	Lowell, Mass.
1868	JONATHAN TAFT	Cincinnati, Ohio.
1869†	HOMER JUDD	St. Louis, Mo.
1870	W. H. MORGAN	Nashville, Tenn.
1871	GEO. H. CUSHING	Chicago, Ill.
1872	P. G. C. HUNT	Indianapolis, Ind.
1873	T. L. BUCKINGHAM	Philadelphia, Pa.
1874	M. S. DEAN	Chicago, Ill.
1875	A. L. NORTHROP	New York, N. Y.
1876	GEO. W. KEELY	Oxford, Ohio.
1877	F. H. REHWINKEL	Chillicothe, Ohio.
1878	H. J. MCKELLOPS	St. Louis, Mo.
1879	L. D. SHEPARD	Boston, Mass.
1880	C. N. PEIRCE	Philadelphia, Pa.
1881	H. A. SMITH	Cincinnati, Ohio.
1882	W. H. GODDARD	Louisville, Ky.
1883	E. T. DARBY	Philadelphia, Pa.
1884	J. N. CROUSE	Chicago, Ill.
1885	W. C. BARRETT	Buffalo, N. Y.
1886	W. W. ALLPORT	Chicago, Ill.
1887	FRANK ABBOTT	New York, N. Y.
1888	C. R. BUTLER	Cleveland, Ohio.
1889	M. W. FOSTER	Baltimore, Md.
1890	A. W. HARLAN	Chicago, Ill.
1891	W. W. WALKER	New York, N. Y.
1892	J. D. PATTERSON	Kansas City, Mo.
1893	Formal session only, owing to the holding of the World's Columbian Dental Congress; officers elected in 1892 held over until 1894.	
1894	J. Y. CRAWFORD	Nashville, Tenn.
1895	J. Y. CRAWFORD	Nashville, Tenn.
1896	JAS. TRUMAN	Philadelphia, Pa.

* First meeting, for organization.

† Owing to a change in the Constitution, officers elected at this and the sessions following served at the next annual meeting subsequent to their election.

EX-PRESIDENTS OF THE SOUTHERN DENTAL ASSOCIATION.

1869*	W. T. Arrington	Memphis, Tenn.
1870	W. T. Arrington	Memphis, Tenn.
1871	Jas. S. Knapp	New Orleans, La.
1872	F. Y. Clark	Savannah, Ga.
1873	H. M. Grant	Abingdon, Va.
1874	Robt. Arthur	Baltimore, Md.
1875	J. R. Walker	New Orleans, La.
1876	W. T. Arrington	Memphis, Tenn.
1877	W. G. Redmond	Louisville, Ky.
1878	S. J. Cobb	Nashville, Tenn.
1879	F. J. S. Gorgas	Baltimore, Md.
1880	J. B. Patrick	Charleston, S. C.
1881	V. E. Turner	Raleigh, N. C.
1882	E. S. Chisholm	Tuscaloosa, Ala.
1883	L. D. Carpenter	Atlanta, Ga.
1884	H. J. McKellops	St. Louis, Mo.
1885	A. O. Rawls	Lexington, Ky.
1886	W. C. Wardlaw	Augusta, Ga.
1887	W. W. H. Thackston	Farmville, Va.
1888	B. H. Catching	Atlanta, Ga.
1889	J. Y. Crawford	Nashville, Tenn.
1890	John C. Storey	Dallas, Texas.
1891	G. F. S. Wright	Georgetown, S. C.
1892	Gordon White	Nashville, Tenn.
1893	B. Holly Smith	Baltimore, Md.
1894	Same officers hold over.	
1895	H. E. Beach	Clarksville, Tenn.
1896	John S. Thompson	Atlanta, Ga.
1897	W. H. Richards	Knoxville, Tenn.
1898†	E. P. Beadles	Danville, Va.

*First meeting for organization; Jas. S. Knapp, Chairman *pro tem.*

†First President of the Southern Dental Association as a branch of the National Dental Association, organized August, 1897, by the consolidation of the American Dental Association and the Southern Dental Association.

LIST OF OFFICERS.

PRESIDENT, G. V. Black, Chicago.

VICE-PRESIDENT, West, Truman W. Brophy, Chicago.

" " East, E. S. Gaylord, New Haven.

" " South, M. F. Finley, Washington, D. C.

RECORDING SECRETARY, A. H. Peck, Chicago.

CORRESPONDING SECRETARY, Mary E. Gallup, Boston.

TREASURER, Henry W. Morgan, Nashville.

EXECUTIVE COMMITTEE—J. D. Patterson, Chairman. First Division, Committee of Arrangements, J. D. Patterson, C. N. Johnson, H. A. Smith; Second Division, Committee on Credentials and Auditing, V. H. Jackson, T. P. Hinman, T. S. Waters; Third Division, Committee on Voluntary Essays, C. S. Butler*, G. V. I. Brown*, J. Y. Crawford*.

EXECUTIVE COUNCIL—H. J. Burkhart, J. Y. Crawford, B. Holly Smith, W. E. Griswold, Thos. Fillebrown. (G. V. Black, A. H. Peck, *ex-officio* members.)

SECTION I. Prosthetic Dentistry, Crown- and Bridge-Work, Metallurgy, Chemistry, and Orthodontia—V. H. Jackson, Chairman; W. E. Walker, Secretary.

SECTION II. Dental Education, Literature, Nomenclature, Histology, and Microscopy—S. H. Guilford, Chairman; M. F. Finley, Secretary.

SECTION III. Operative Dentistry, Materia Medica, and Therapeutics—T. E. Weeks, Chairman; J. I. Hart, Secretary.

SECTION IV. Physiology, Etiology, Hygiene, Prophylaxis, and Electricity—J. D. Patterson, Chairman; L. E. Custer, Secretary.

SECTION V. Anatomy, Pathology, and Surgery—W. C. Barrett, Chairman; M. L. Rhein, Secretary.

*Term expires 1901.

SECTION VI. Clinics—Thos. P. Hinman, Chairman; M. B. Culver, Secretary.

COMMITTEE ON HISTORY—Chas. McManus, Chairman; H. L. Ambler, Gordon White, Jonathan Taft, H. B. Noble.

COMMITTEE ON TERMINOLOGY—Grant Molyneaux, Chairman.

COMMITTEE ON INTERNATIONAL RELATIONS AS TO DIPLOMAS—J. N. Crouse, Chairman; Gordon White, R. Ottolengui.

COMMITTEE ON ARMY AND NAVY LEGISLATION—M. F. Finley, Chairman; Wms. Donnally, Secretary; C. S. Butler, T. T. Moore, J. A. Libbey, Gordon White.

COMMITTEE ON NATIONAL DENTAL MUSEUM AND LIBRARY—Wms. Donnally, Chairman; Henry W. Morgan, John S. Marshall.

COMMITTEE ON INTERNATIONAL DENTAL CONGRESS—A. W. Harlan, Chairman; W. E. Griswold, Secretary.

COMMITTEE ON RESOLUTIONS PRESENTED BY DR. RICHARD GRADY—Richard Grady, Chairman; H. H. Johnson, W. E. Walker, I. P. Wilson, C. N. Johnson.

COMMITTEE ON NECROLOGY—Johathan Taft, Chairman; W. E. Boardman, E. S. Gaylord.

PUBLICATION COMMITTEE—A. H. Peck, Chairman; J. N. Crouse, W. E. Grant.

ORGANIZATION OF SECTIONS.

SECTION I. Prosthetic Dentistry, Crown- and Bridge-Work, Metallurgy, Chemistry, and Orthodontia.

W. E. Grant, F. N. Brown, C. L. Babcock, J. J. Wright, J. H. Kennerly, W. Storer How, H. T. Harvey, F. LeGrand Ames, A. J. McDonald, M. A. Knapp, G. W. Miller, L. S. Gilbert, C. E. Parkhurst, O. J. Gross, C. W. Appler, H. R. Jewett, G. E. Savage, F. G. Gregory, V. E. Turner, H. T. Smith, G. E. Hardy, V. S. Jones, J. A. Hall, H. J. Goslee, H. S. Abendschein, G. M. Whitfield, J. H. Benton, J. N. Van De Water, I. P. Wilson, Wm. E. Walker, L. C. Taylor, S. C. G. Watkins, W. V-B. Ames, J. S. Cassidy, A. O. Hunt, C. R. Turner, E. J. Tucker, W. B. Finney, R. Ottolengui, A. W. Gaylord, Wm. Conrad, H. B. Noble, E. E. Cruzen, Edw. G. Snodgrass, G. H. Wilson, Henry McManus, R. H. Nones, S. E. Gilbert, Thos. Morffew, Mary E. Gallup, J. N. Farrar, D. D. Smith, C. L. Goddard, W. W. Evans, C. S. Hardy, V. H. Jackson, R. E. Maercklein, H. A. Parr.

SECTION II. Dental Education, Literature, Nomenclature, Histology, and Microscopy.

L. D. Shepard, H. T. Harvey, E. S. Holmes, J. A. Libbey, C. C. Chittenden, J. L. Williams, Chas. McManus, L. A. Faught, C. A. Brackett, B. D. Brabson, W. E. Boardman, E. H. Smith, H. E. Roberts, M. F. Finley, Wms. Donnally, Chas. S. Butler, Richard Grady, O. J. Fruth, H. B. Tileston, M. F. Ault, B. Holly Smith, J. H. Moore, A. J. Brown, T. T. Moore, W. H. Morgan, William E. Walker, G. L. Simpson, A. H. Thompson, Mary E. Gallup, J. N. Farrar, D. D. Smith, John F. Dowsley, C. S. Hardy.

SECTION III. Operative Dentistry, Materia Medica, and Therapeutics.

G. Marshall Smith, E. K. Wedelstaedt, A. W. Gaylord, Laurence Leonard, H. P. Yerkes, F. D. Gardiner, Wm. Conrad, C. R. Jefferis, N. S. Hoff, B. F. Luckey, M. B. Culver, E. P. Hawes, H. B. Noble, A. C. Brewer, Thos. Morffew, S. E. Gilbert, A. P. Gore, E. A. Bogue, C. D. Cook, W. F. Litch, Thos. Fillebrown, W. E. Burkhart, S. E. Knowles, A. F. Merriman, Jr., S. W. Foster, W. K. Sinton, T. P. Hinman, J. Thos. Lippincott, D. D. Smith, C. C. Van Vleck, Joseph Head, Herbert C. Miller, R. H. Hofheinz, Josephine D. Pfeiffer, C. S. Hardy, S. L. Goldsmith, G. W. Field, W. T. McLean, O. J. Fruth, H. B. Tileston, H. J. Burkhart, Frank H. Gardiner, M. F. Ault, Henry Barnes, L. T. Canfield, A. H. Fuller, H. J. Goslee, G. V. Black, H. L. Ambler, W. F. Fundenberg, Louis Jack, J. Y. Crawford, G. E. Hunt, W. P. Dickinson, M. A. Mason, J. N. Crouse, H. J. McKellops, A. W. Harlan, Corydon Palmer, H. S. Abendschein, B. Holly Smith, F. J. Maynard, G. H. Claude, D. M. Clapp, W. S. Elliott, J. H. Moore, Jas. Huggins, C. S. Stockton, A. J. Brown, J. I. Hart, T. M. Allen, R. A. McDonald, J. H. London, A. C. Fones, C. N. Peirce, A. J. Prosser, I. Simpson, J. J. Sarrazin, W. D. Tracy, Jas. Truman, H. H. Johnson, N. T. Shields, G. M. Whitfield, T. T. Moore, J. H. Benton, S. Freeman, J. N. Van De Water, Robt. Huey, A. E. Lyman, T. E. Weeks, P. J. Wilson, C. L. Alexander, Wm. E. Walker, M. S. Merchant, Edwin T. Darby, A. R. Starr, J. S. Knapp, R. W. Talbott, L. C. Taylor, G. L. Simpson, W. E. Chambers, E. S. Gaylord, E. P. Beadles, S. C. G. Watkins, G. W. Hoysradt, S. B. Palmer, C. N. Johnson, J. S. Cassidy, W. V-B. Ames, J. S. Hurlbut, A. L. Northrop, W. E. Page, R. B. Reitz, F. A. Remington, A. H. Sibley, B. E. Wright, Louis Augspath, F. W. Allen, Jos. Bauer, H. E. Beach, H. D. Boyd, C. T. Brockett, J. P. H. Brown, W. H. Burr, G. V. I. Brown, Ellen R. Carr, L. D. Carpenter, Emma E. Chase, Wm. N. Cogan, W. T. Cole, W. H. Cook, J. P. Corley, L. E. Custer, F. Y. Clark, Wm. Carr, J. H. Collins, D. M. Cattell, L. P. Dotterer, L. F. Davis, D. E. Everitt, W. H. Ewall, J. G. Fife, G. J. Friedrichs, W. H. Fundenberg,

O. J. Fruth, J. A. Gorman, C. W. F. Holbrook, Frank Holland, Sidney G. Holland, J. C. Hertz, Alphonso Irwin, Bush Jones, A. B. King, Lou.s C. LeRoy, H. A. Lowrance, J. Hall Lewis, E. B. Marshall, H. W. Morgan, H. B. McFadden, Henry McManus, B. O. McGee, G. S. Mason, T. H. Parramore, A. H. Peck, B. J. Pressey, J. B. Pressey, F. W. Parker, E. G. Quattlebaum, Samuel Rambo, W. B. Reynolds, Meyer L. Rhein, C. B. Rohland, C. H. Robinson, C. H. Riggs, Thos. C. Stellwagen, B. Q. Stevens, M. B. Straight, H. S. Sutphin, W. A. Summerlin, W. K. Slater, J. A. Tigner, V. E. Turner, R. H. Walker, J. L. Walker, T. S. Waters, Gordon White, H. L. Wheeler; W. A. White, E. R. Warner, John Welch, E. R. Wright, F. J. S. Gorgas, F. W. Low.

SECTION IV. Physiology, Etiology, Hygiene, Prophylaxis, and Electricity.

W. Storer How, H. T. Harvey, I. P. Wilson, D. A. Jones, Richard Grady, V. S. Jones, H. J. Allen, Garrett Newkirk, J. D. Patterson, Henry Barnes, H. S. Abendschein, G. H. Claude, S. Freeman, Wm. E. Walker, R. W. Talbott, Laurence Leonard, W. G. Mason, J. E. Cravens, S. J. Cockerille, F. W. Stiff.

SECTION V. Anatomy, Pathology, and Surgery.

W. H. Whitslar, B. G. Maercklein, Wm. H. G. Logan, J. D. Patterson, W. C. Barrett, J. A. Hall, J. S. Spurgeon, W. T. McLean, J. Y. Crawford, B. Holly Smith, Wm. E. Walker, A. O. Hunt, Laurence Leonard, H. T. King, S. H. Thompson, H. Clay Ferris, Thos. Fillebrown, T. W. Brophy, George W. Cook, Herbert C. Miller, C. S. Hardy, A. H. Thompson.

SECTION VI.—Clinics.

F. N. Brown, G. W. Miller, S. Dickson, J. E. Orrison, G. E. Hardy, Wm. W. Shryock, J. A. Dunn, Chas. Sill, T. M. Wyatt, B. G. Maercklein, H. J. Goslee, H. S. Abendschein, T. M. Allen, A. J. Prosser, I. Simpson, L. C. Taylor, A. W. Gaylord, Laurence Leonard, H. P. Yerkes, Wm. Conrad, M. B. Culver, E. G. Snodgrass, C. A. Meeker, Thos. P. Hinman, C. S. Hardy, B. Rutledge.

Constitution of the National Dental Association.

ADOPTED AT OLD POINT COMFORT AUGUST 5, 1897.

PREAMBLE.

We, the members of the American Dental Association and of the Southern Dental Association, do declare ourselves a Society to cultivate the Science of Dentistry, and have adopted the following Constitution and Rules of Order for our government.

CONSTITUTION.

ARTICLE I.

NAME.

This organization shall be known by the name of the National Dental Association.

ARTICLE II.

OBJECT.

The object of this Association shall be to cultivate the science and art of dentistry and all its collateral branches, to elevate and sustain the professional character of dentists, to promote among them mutual improvement, social intercourse, and good feeling, and collectively to represent and have cognizance of the common interests of the dental profession.

ARTICLE III.

MEMBERS TO BE OF THREE CLASSES.

SECTION 1. The members of this Association shall be of three classes,—viz, permanent, delegate, and honorary members; the two former classes having equal rights and privileges, except that none but permanent members shall be eligible to office.

PERMANENT MEMBERS.

SEC. 2. Permanent members shall consist of those who, coming as delegates and complying with the requirements of the Association, shall sign a statement in a book to be kept for that purpose, signifying to the Treasurer a desire for permanent membership.

DELEGATE MEMBERS.

SEC. 3. All delegate members shall be practitioners of dentistry. They shall be received only from permanently organized dental societies. They shall be elected by ballot at some regular meeting of their society, and shall

be members who have done some meritorious work for the profession; but no person shall be received as a delegate who is in arrears for dues to this Association.

SEC. 4. Honorary members shall consist of prominent, worthy members of the dental profession residing in foreign countries, who shall be elected by ballot.

SEC. 5. It is hereby specially provided that all persons at present permanent members of the American Dental Association and of the Southern Dental Association are permanent members of this Association, and entitled to all the privileges of the class to which they belonged, without further action, and the Treasurer is hereby directed to transcribe their names upon the roll of membership of this Association.

ARTICLE IV.

DELEGATES FROM STATE SOCIETIES.

SECTION 1: Any permanently organized dental society may send one for every six of its active members, as delegates to this Association for one year, upon complying with the requirements of its Constitution; but no society shall be entitled to representation that does not adopt or substantially recognize the Code of Ethics of this Association.

SEC. 2. Each delegate shall present credentials which shall be approved by the Executive Committee.

SEC. 3. If the Committee on Credentials has knowledge that any applicant for membership is violating the Code of Ethics, said applicant shall not be received, but shall be referred by the committee to the societies whose delegates they are, and in no case shall this Association be compelled to treat with violations of the Code except the violator is a member of this body and has no membership in any local body.

SEC. 4. This Association will receive no delegates who, since August, 1875, shall have entered the profession without having first graduated at some reputable dental or medical college.

ARTICLE V.

SIGNING CONSTITUTION.

SECTION 1. Each new member, before voting or speaking on any subject before the meeting, shall sign this Constitution, inscribing his name and the title of the society from which he receives his appointment.

DUES.

SEC. 2. The annual dues in this Association shall be five dollars.

DUES—TO BE PAID.

SEC. 3. No member is eligible to office, nor can he speak or vote in this Association or in any of its branches, until his annual dues are paid.

DUES—IF UNPAID.

SEC. 4. If the dues of any member remain unpaid for two years his name shall be erased from the list of members of this Association.

CONDUCT OF MEMBERS.

SEC. 5. Any act of special immorality or unprofessional conduct committed by a member of this Association shall be referred to the Executive Committee, whose duty it shall be to thoroughly examine into the case, and if the charges be sustained, to report to the Executive Council at the next meeting of the annual session at which the charges are preferred. Whereupon, by a vote of the Council, the offending member may be reprimanded or expelled, a two-thirds vote being required for expulsion, a majority being sufficient for reprimand.

EXPELLED MEMBERS.

SEC. 6. Any member of this Association being expelled or suspended from his local society, shall from that date cease to be a member of this body.

RESIGNATION OF MEMBERS.

SEC. 7. Any member not in arrears may offer his resignation, upon the acceptance of which, by the Council, his membership shall cease; but the Council may at any time thereafter reinstate such member by unanimous consent.

ARTICLE VI.

OFFICERS.

SECTION 1. The officers of this Association shall be a President, three Vice-Presidents, Corresponding Secretary, Recording Secretary, Treasurer, and an Executive Committee consisting of nine members.

EXECUTIVE COUNCIL.

SEC. 2. The President, Secretary, and five members to be elected annually by the Association shall constitute an Executive Council, and shall be governed by the same rules of order as the Association.

TERM OF OFFICE.

SEC. 3. Each officer, except as otherwise provided, shall hold his appointment for one year, or until another is elected and qualified to succeed him.

ELECTION OF OFFICERS.

SEC. 4. The President, Vice-Presidents, Corresponding Secretary, Recording Secretary, Treasurer, and members of the Executive Council and Executive Committee shall be elected by ballot in open session of the Association. Three members of the Executive Committee shall be chosen from each division.

SEC. 5. Commencing with 1898 the President shall be chosen from the division in which the meeting is to be held.

SEC. 6. One of the Vice-Presidents shall be chosen from each division,—namely, one from the East, one from the West, and one from the South.

SEC. 7. The candidates for President and Vice-Presidents shall be nominated by an informal ballot of the Association. The three names, or, in case of a tie, the four names, having the greatest number of votes, shall be the sole nominees.

A formal ballot shall then be taken, in which a majority of the ballots cast shall be necessary to a choice.

The informal ballot may be made formal by a three-fourths vote of the members present.

ARTICLE VII.

DUTIES OF OFFICERS.

DUTIES OF PRESIDENT.

SECTION 1. The President shall preside according to parliamentary usage as laid down in "Roberts's Rules of Order" and the rules of order adopted by this Association, and shall present an annual address.

DUTIES OF VICE-PRESIDENTS.

SEC. 2. In the absence of the President, one of the Vice-Presidents shall perform the duties of the office, and in the absence of these officers a chairman *pro tem.* shall be appointed by the Executive Committee.

DUTIES OF CORRESPONDING SECRETARY.

SEC. 3. The Corresponding Secretary shall attend to the correspondence of the Association with the societies therein represented, and with other scientific bodies as may be desirable, and shall report to the Executive Council.

DUTIES OF RECORDING SECRETARY.

SEC. 4. The Recording Secretary shall keep accurate minutes of the proceedings of the Association, preserve the archives and unpublished documents, and attend to the other duties that pertain to his office. He shall be *ex-officio* chairman of the Publication Committee, and shall see that due notice is given of the time and place of the sessions of the Association.

DUTIES OF TREASURER.

SEC. 5. The Treasurer shall hold all the moneys belonging to the Association, and shall keep an accurate account as between the Association and its members. He shall furnish bonds satisfactory to the Executive Committee. He shall attend the session of the Executive Committee at 8 A.M. on the day of the annual meeting to receive dues, and shall attend at roll-call to verify the list of names, checking all such as are in arrears for dues; he shall restore such names upon payment of dues within the legal limits, and shall notify all whose names may be erased from the list of membership. He shall pay the drafts of the Secretary, countersigned by the President, and shall report to the Executive Committee, where his accounts shall be audited and by whom his report shall be presented to the Executive Council, together with their own.

SEC. 6. All resolutions appropriating money, except for the legitimate expenses of this Association, shall require a two-thirds vote of all the members of the Association present at a regular meeting.

EXECUTIVE COUNCIL.

SEC. 7. The Executive Council shall meet at 10 o'clock on the day of the first meeting of each annual session, and afterward by adjournment, or at

the call of the presiding officers for the reception of the reports of officers and committees, and for the transaction of other business of the Association.

SEC. 8. All matters not otherwise specially provided for shall be referred to the Executive Council without debate.

SEC. 9. The Executive Council shall report to the Association at each session the results of their proceedings for ratification or rejection without debate.

SEC. 10. The President and Secretary of the Association shall hold the same position in the Executive Council as in the Association.

SEC. 11. Four members of the Council shall constitute a quorum for the transaction of business.

SEC. 12. All meetings of the Council shall be public, the time and the place for which shall be posted for information of the members. Members may be heard on any matter before the Council.

ARTICLE VIII.

EXECUTIVE COMMITTEE.

SECTION 1. The Executive Committee shall be the business committee of the Association. They shall report to the Executive Council at each session, under the proper head, their doings for the current year.

CLASSIFICATION OF EXECUTIVE COMMITTEE.

SEC. 2. At the first election of the Executive Committee, the first three shall be elected to serve three years, the second three for two years, and the last three for one year, and thenceforward one new member shall be elected each year by separate ballot, from each division, to serve three years, and in case of the absence of any member of this committee his place may be temporarily filled by the remaining members of the committees.

SUBDIVISION OF EXECUTIVE COMMITTEE.

SEC. 3. The Executive Committee shall meet after the election of new members to choose their own chairman and secretary, and to divide themselves into three sub-committees as follows, and for the purposes described:

FIRST DIVISION.—COMMITTEE OF ARRANGEMENTS.

SEC. 4. The first division of this committee shall act as the Committee of Arrangements, and shall make suitable preparations for the meetings of the Association, of which they shall have the charge. They shall provide a book for the registration of members or visitors as they arrive, with the place of their residence and hotel address, and shall attend to the general wants of the Association during its session. It shall be their further duty to secure from the Treasurer a good and sufficient bond.

SECOND DIVISION.—CREDENTIALS AND AUDITING COMMITTEE.

SEC. 5. The second division shall examine and verify the credentials and

qualifications of members, including all violations of the Code of Ethics and the Constitution, and shall also be the Auditing Committee for that year.

THIRD DIVISION.—COMMITTEE ON VOLUNTEER ESSAYS.

SEC. 6. The third division shall examine all volunteer essays before they are read to the Association, and such as they approve they shall refer to the proper Section.

They shall report names of places for the next session of the Association.

REPORTS OF SUB-COMMITTEES.

SEC. 7. Each of these sub-committees shall report from time to time, as may be necessary, to the Executive Committee as a whole, who shall decide upon such report, if possible; but in case of their inability to decide upon any matter, it shall be brought before the Executive Council for its decision.

MEETINGS OF EXECUTIVE COMMITTEE.

SEC. 8. The Executive Committee shall, if possible, meet for consultation and arrangement of their respective duties on the day preceding the annual session of the Association, and shall meet for the examination of credentials and the reception of papers, and such other business as may properly come before them, at 8 A.M. on the first day of the annual session.

CHAIRMAN MAY CONVENE THE COMMITTEE.

SEC. 9. The Chairman of the Executive Committee may at his own discretion summon the members thereof to a meeting at any suitable hour during the sessions of the Association, and at any other time at the request of five members of the committee.

ARTICLE IX.

LOCAL COMMITTEE OF ARRANGEMENTS.

SECTION 1. There shall be appointed by the President, annually, a committee of three, residing at or near the place selected for the next meeting, whose duty it shall be to assist the Executive Committee to procure rooms for meetings, and make such other local arrangements as may be needed for the Association.

PUBLICATION COMMITTEE, HOW APPOINTED.

SEC. 2. The President shall appoint two members of this Association who shall act in conjunction with the Recording Secretary as the Publication Committee. The Committee shall be authorized to employ a competent reporter to furnish an accurate report of the proceedings of each meeting.

INSTRUCTIONS TO THE PUBLICATION COMMITTEE.

SEC. 3. The Publication Committee shall superintend the publication and distribution of such portions of the transactions as the Executive Council may direct, or the committee judge to be of sufficient value. They shall specify in the annual report of this committee the character and cost of the publications of the Association during the year, and the number of copies still on hand.

SEC. 4. Any report or other paper, to be entitled to publication in the volume of the Transactions for the year in which it shall be presented to the Association, must be placed in the hands of the Publication Committee within twenty days after the close of the annual session, and must also be so prepared that the proof sheets furnished the authors shall be returned to the committee without material alteration or addition.

SEC. 5. Every paper received by this Association, and all plates or other means of illustration, shall be considered the exclusive property of the Association, and shall be published for its benefit.

DISCLAIMER.

SEC. 6. The Publication Committee is hereby instructed to print at the beginning of each volume of the Transactions the following disclaimer,—viz, "The National Dental Association, although formally accepting and publishing the reports of the various Sections, and the essays read before the Association, holds itself wholly irresponsible for the opinions, theories, or criticisms therein contained, except when otherwise decided by special resolution."

ARTICLE X.

QUORUM.

Fifteen members shall constitute a quorum in this Association.

ARTICLE XI.

SUSPENSION OF RULES.—THREE-FOURTHS TO VOTE.

The regular order of business may be temporarily suspended by a three-fourths vote of all the members present, for the consideration of a specific subject, upon the completion of which the regular order shall be at once resumed.

ARTICLE XII.

TIME AND PLACE OF MEETINGS.

SECTION 1. The regular sessions of this Association shall commence annually at 11 A.M. on the first Tuesday after the last Saturday in August, or at such time as shall be determined by vote of the Association at the annual session.

SEC. 2. The place for holding the next annual session shall be determined each year by ballot of the Association at its annual session, except that the place of meeting shall be in the West in 1898, in the East in 1899, and in the South in 1900, and thereafter, in the order named, meeting in each section every third year.

SEC. 3. For the purposes of this Association, the United States shall be divided into three divisions, to be called The East, The South, and The West.

The East shall include New England, New York, New Jersey, Pennsylvania, Ohio, Indiana, lower peninsula of Michigan, and Ontario.

The South shall include Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida, Ala-

bama, Mississippi, Louisiana, Texas, Kentucky, Tennessee, Arkansas, Oklahoma, and Indian Territory.

The West shall include Illinois, Missouri, Wisconsin, upper peninsula of Michigan, Minnesota, Iowa, North Dakota, South Dakota, Nebraska, Kansas, Montana, Wyoming, Colorado, Idaho, Utah, Washington, Oregon, Nevada, California, Arizona, New Mexico, and Alaska.

ARTICLE XIII.

ORGANIZATION OF SECTIONS.

SECTION 1. This Association shall be divided into six Sections, as follows:

1. Prosthetic Dentistry, including Crown- and Bridge-Work, Metallurgy, Chemistry, Orthodontia.
2. Dental Education, Literature, Nomenclature, Histology, Microscopy.
3. Operative Dentistry, Materia Medica, and Therapeutics.
4. Physiology, Etiology, Hygiene, Prophylaxis and Electricity.
5. Anatomy, Pathology, and Surgery.
6. Clinics.

SEC. 2. It shall be the duty of each member to identify himself with one or more of the above-named Sections, and he shall inform the Recording Secretary of his choice at the time of joining the Association.

SEC. 3. The Secretary shall assign members to the Sections in which they are expected to work if they shall fail to make their own choice before the close of the morning meeting of the second day of the session.

SEC. 4. It shall be the duty of the Recording Secretary, immediately at the close of the morning meeting of the second day, to present lists of the names of each Section, as a basis for the organization of the Sections.

SEC. 5. The members of each Section shall choose a Chairman and Secretary, and they shall be members known to be capable, and interested in the performance of the duties of the offices.

SEC. 6. The Chairman of each Section shall preside at all of its meetings; shall exercise general supervision over the business, and shall see that the labors of his Section are conducted in the manner calculated to secure the best results. The Chairman, and such other member or members as the Section shall select, shall prepare and read at the annual session of the Association next ensuing, a paper or papers on the advances and discoveries of the past year in the branches included in the Section. The reading of such papers shall not together occupy more than forty minutes.

SEC. 7. The several Sections shall meet at 9.30 A.M. on the morning of the first day of the annual session of the Association.

SEC. 8. For the information of all members, a list of the members of each Section shall be published in the Transactions of each year.

SEC. 9. The reports of the Sections shall be called by the President in consecutive order, beginning each succeeding year one number higher than on the preceding year, and no Section having been called and passed shall be again heard until all others have been called.

ARTICLE XIV.

BRANCHES.

SECTION 1. For the wider diffusion of the benefits of this Association, the members of each division may form themselves into one or more separate bodies, to be styled "Branches."

POWERS AND OBLIGATIONS.

SEC. 2. Branches shall have such powers and privileges, and be subject to such obligations, as shall be determined upon from time to time by the National Association in annual session.

GOVERNMENT.

SEC. 3. Each branch shall be free to hold meetings and to govern itself as its members shall think fit, but no branch law shall be valid which, in the opinion of the National Association, may contravene any fundamental law of the Association.

EXPENSES.

SEC. 4. Each branch shall pay its own expenses, and no branch shall be deemed for any purpose the agent of the Association, or have power to incur any obligation in its behalf.

PROCEEDINGS.

SEC. 5. Each branch shall furnish a copy of its proceedings, including papers and discussions, for publication with the Transactions of the National Association.

DELEGATES.

SEC. 6. Each branch may receive delegates from societies within its division upon the same conditions as the National Association, and such delegates shall have the same standing in the National Association as though admitted directly from the State societies.

DUES.

SEC. 7. The annual dues of members attending the branches shall be paid to the branch Treasurer. Two-fifths of the dues may be retained for the benefit of the branch. The remaining three-fifths shall be paid over to the Treasurer of the National Association.

SEC. 8. The annual session of any branch shall be omitted whenever the annual session of the National Association shall be held in its division.

RULES OF ORDER.

1. On the arrival of the hour of meeting, the President shall take the chair, call to order, and announce that the meeting is open for business.

2. No motion or speech shall be in order until the mover or speaker shall have been recognized and assigned the floor by the chair, nor shall a motion be open for debate until seconded and stated by the chair.

3. No one shall be permitted to address the Association before giving his

name and residence, which shall be distinctly announced from the chair; nor shall he speak more than twice, nor longer than fifteen minutes in all, unless by consent of the Association.

4. At the request of any member a motion shall be put in writing.

5. At the request of five members a question shall be divided, or the yeas and nays ordered.

6. When a question is under debate, no other motion shall be in order, except—1st, to adjourn; 2d, to lay on the table; 3d, the previous question; 4th, to postpone; 5th, to commit; 6th, to amend;—and these motions shall take precedence in the order here stated.

7. The previous question, and the motions to adjourn, to lay on the table, and to postpone, shall be decided without debate.

8. A motion to adjourn shall always be in order, but no member can make such a motion while another is speaking, or while a vote or ballot is being taken.

9. A second amendment to the main question shall not be in order until the first is disposed of, nor shall there be an amendment of an amendment to an amendment.

10. After a motion has been seconded and stated by the chair, it shall not be withdrawn without the consent of the Association.

11. No member shall interrupt another while speaking, except to raise a point of order.

12. When called to order, a member shall sit down until the point of order is decided by the chair, or, in case of appeal, by the Association. If the point of order be sustained, the member can proceed in order by the consent of the Association.

13. Every member shall vote upon a question unless excused by the Association.

14. When any motion, except to adjourn, has been rejected, it shall not be renewed without unanimous consent.

15. Any member who on a question voted in the majority may move a reconsideration of that question; but if that motion shall be lost or laid upon the table, it shall not be renewed without unanimous consent.

16. The President may vote with the members upon all questions, but having so voted, shall not give the casting vote in case of a tie.

17. Motions for filling blanks shall be put in the order in which they are moved.

18. On a division, or in voting by yeas and nays, any member may change his vote before the result is declared.

19. These rules may be suspended by unanimous consent.

ORDER OF BUSINESS.

8 A.M.—Meeting of Executive Committee for filling of vacancies.

9 A.M.—Meeting of Executive Council.

9.30 A.M.—Meeting of Sections.

11 A.M.—Meeting of the Association.
President's Address.
Report of Sections and discussions.
Report of Executive Council.
Ballot for place of next annual session.
Election of Officers.
Installation of Officers.
Appointment of Committees.
Reading of minutes.
Adjournment.

AMENDMENTS.

The Constitution, Rules of Order, and Order of Business of this Association may be altered or amended at any annual session by unanimous consent of the members present, providing notice has been given in writing at a previous meeting of the annual session at which the amendment is proposed; or by a vote of two-thirds of the members present, providing notice of the alteration or amendment has been given in writing at a previous annual session.

STANDING RESOLUTIONS.

The following standing resolutions are in force at this time:

1. *Resolved,* That a paper presented to the Committee on Voluntary Essays, and by them considered and returned to the writer with notification that the said paper is not accepted, cannot afterward be read before the Association unless it is made the special order by resolution adopted.

2. *Resolved,* That this Association discountenances the giving of banquets, excursions, entertainments, etc., by local professional societies or individuals, either during or at the close of our annual meetings.

3. *Resolved,* That it is unprofessional to use on cards or signs anything except name, title, and address.

4. *Resolved,* That this Association now in session direct that Sections belonging thereto shall in the future be prohibited from inviting individuals who are violating the Code of Ethics to hold clinics, or to give other exhibitions before this body.

5. *Resolved,* That a Standing Committee of three be appointed, to be known as the Committee on Terminology, whose duty it shall be to prepare and submit a carefully prepared report at each annual meeting of this Association.

6. *Resolved,* That this Association believes the conferring of honorary degrees in dentistry to be detrimental to the profession of dentistry, and hereby expresses its disapprobation of the practice.

7. *Resolved*, That a committee of three be appointed by the chair to co-operate with the officers in charge of the Army Medical Museum and Library in enriching its stores of dental literature and specimens, especially by appealing to dental societies and individual members of the dental profession for assistance.

8. *Resolved*, That the National Dental Association condemns the use of secret preparations known as "local anesthetics," as well as all other secret preparations.

9. *Resolved*, That the secretary or other officer of each society sending delegates to this Association is expected to make a general report of the work done by the society he represents during the year, giving the subjects of the papers read before them and digests of the same, and to send said reports to the Secretary of this Association at least three weeks before the date of each annual meeting; the reports to be forwarded to the Chairman of the Section to which they belong.

10. *Resolved*, That any member of the dental profession who has been in reputable practice for a period of fifty years may be elected to permanent membership in the Association without payment of dues, and any member of this Association who has been in practice for a like period shall have his dues remitted thereafter by presenting the fact to the Treasurer of the Association.

11. *Resolved*, That lists of the ex-presidents of the American Dental Association and of the Southern Dental Association shall be published annually in the Transactions of the National Dental Association, and that all members and officers hold the same relations to the National Dental Association that they did to the former associations.

Code of Ethics.

ARTICLE I.—THE DUTIES OF THE PROFESSION TO THEIR PATIENTS.

SECTION 1. The dentist should be ever ready to respond to the wants of his patrons, and should fully recognize the obligations involved in the discharge of his duties toward them. As they are in most cases unable to correctly estimate the character of his operations, his own sense of right must guarantee faithfulness in their performance. His manner should be firm, yet kind and sympathizing, so as to gain the respect and confidence of his patients; and even the simplest case committed to his care should receive that attention which is due to operations performed on living, sensitive tissue.

SEC. 2. It is not to be expected that the patient will possess a very extended or a very accurate knowledge of professional matters. The dentist should make due allowance for this, patiently explaining many things which may seem quite clear to himself, thus endeavoring to educate the public mind so that it will properly appreciate the beneficent efforts of our profession. He should encourage no false hopes by promising success when, in the nature of the case, there is uncertainty.

SEC. 3. The dentist should be temperate in all things, keeping both mind and body in the best possible health, that his patients may have the benefit of that clearness of judgment and skill which is their right.

ARTICLE II.—MAINTAINING PROFESSIONAL CHARACTER.

SECTION 1. A member of the dental profession is bound to maintain its honor, and to labor earnestly to extend its sphere of usefulness. He should avoid everything in language and conduct calculated to dishonor his profession, and should ever manifest a due respect for his brethren. The young should show special respect to their seniors; the aged, special encouragement to their juniors.

SEC. 2. It is unprofessional to resort to public advertisements, cards, handbills, posters, or signs, calling attention to peculiar styles of work, lowness of prices, special modes of operating; or to claim superiority over neighboring practitioners; to publish reports of cases or certificates in the public prints; to circulate or recommend nostrums; or to perform any other similar acts. But nothing in this section shall be so construed as to imply that it is unprofessional for dentists to announce in the public prints, or by cards, simply their names, occupation, and place of business, or, in the

same manner, to announce their removal, absence from, or return to business, or to issue to their patients appointment cards having a fee bill for professional services thereon.

SEC. 3. When consulted by the patient of another practitioner, the dentist should guard against inquiries or hints disparaging to the family dentist, or calculated to weaken the patient's confidence in him; and if the interests of the patient will not be endangered thereby, the case should be temporarily treated, and referred back to the family dentist.

SEC. 4. When general rules shall have been adopted by members of the profession practicing in the same localities in relation to fees, it is unprofessional and dishonorable to depart from those rules, except when variation of circumstance requires it. And it is ever to be regarded as unprofessional to warrant operations as an inducement to patronage.

ARTICLE III.—CONSULTATIONS.

Consultations should be promoted in difficult or protracted cases, as they give rise to confidence, energy, and broader views in practice.

In consultations, that courtesy and just dealing which is the right of all should be especially observed.

ARTICLE IV.—THE RELATIVE DUTIES OF DENTISTS AND PHYSICIANS.

Dental surgery is a specialty in medical science. Physicians and dentists should both bear this in mind. The dentist is professionally limited to diseases of the dental organs and adjacent parts. With these he should be more familiar than the general practitioner is expected to be; and while he recognizes the broader knowledge of the physician in regard to diseases of the general system, the latter is under equal obligations to respect his higher attainments in his specialty.

ARTICLE V.—THE MUTUAL DUTIES OF THE PROFESSION AND THE PUBLIC.

Dentists are frequent witnesses, and, at the same time, the best judges of the impositions perpetrated by quacks, and it is their duty to enlighten and warn the public in regard to them. For this and many other benefits conferred by the competent and honorable dentist, the profession is entitled to the confidence and respect of the public, who should always discriminate in favor of the true man of science and integrity against the empiric and impostor. The public has no right to tax the time and talents of the profession in examinations, prescriptions, or in any way without proper remuneration.

Members of the National Dental Association.

ABENDSCHEIN, H. S. ..... 1644 East Baltimore st., Baltimore, Md.
*ADAMS, J. FRANK ..... 325 College st., Toronto, Can.
*ALBRECHT, MAURICE ..... 61 Ingalls Bldg., Indianapolis, Ind.
ALEXANDER, C. L. ..... 7 South Tryon st., Charlotte, N. C.
ALLEN, FREDERICK W. ..... 40 Pierce Bldg., Boston, Mass.
ALLEN, H. JEROME ..... 421 H st., N. E., Washington, D. C.
ALLEN, T. M. ..... Box 718, Birmingham, Ala.
*AMBLER, H. L. ..... 176 Euclid ave., Cleveland, Ohio.
AMES, F. LEGRAND ..... 63 Washington ave., Albany, N. Y.
AMES, W. V-B. ..... Venetian Bldg., Chicago, Ill.
APPLER, CHAS. W. ..... 1115 G st., Washington, D. C.
AULT, M. F. ..... 1204 College ave., Indianapolis, Ind.
*AYERS, J. M. ..... 110,13 Miller st., New York, N. Y.
*BABCOCK, C. L. ..... 50 Colby & Abbott Bldg., Milwaukee, Wis.
*BARBER, L. L. ..... 508 Spitzer Bldg., Toledo, Ohio.
*BARNES, HENRY ..... New England Bldg., Cleveland, Ohio.
BARRETT, W. C. ..... 208 Franklin st., Buffalo, N. Y.
*BAUER, JOS. ..... New Orleans, La.
BEACH, H. E. ..... Clarksville, Tenn.
*BEACH, JOHN R. ..... Clarksville, Tenn.
BEADLES, E. P. ..... Danville, Va.
BENTON, J. H. ..... Box 445, Newbern, N. C.
*BILLMEYER, U. D. ..... Miller Bldg., Chattanooga, Tenn.
BLACK, G. V. ..... Madison and Franklin sts., Chicago, Ill.
*BLAND, C. A. ..... Charlotte, N. C.
*BLAND, M. A. ..... Charlotte, N. C.
BOARDMAN, WALDO E. ..... 184 Boylston st., Boston, Mass.
BOGUE, E. A. ..... 63 W. 48th st., New York, N. Y.
*BOLLINGER, P. S. ..... 5th and Ludlow sts, Dayton, Ohio.
*BOOZER, D. L. ..... Newberry, S. C.
*BOOZER, J. E. ..... 1516 Main st., Columbia, S. C.
BRABSON, B. D. ..... Knoxville, Tenn.
*BRACKETT, C. A. ..... 102 Touro st., Newport, R. I.
*BROCKETT, C. T. ..... 301-2 The Grand, Atlanta, Ga.
BREWER, ASHWELL C. ..... 521 Charles st., Baltimore, Md.
BROPHY, TRUMAN W. ..... 1405 Champlain Bldg., Chicago, Ill.

*Those marked thus (*) were not present, but sent their dues. Those marked thus (*d*) were delegates, but not permanent members.

BROWN, A. J.....1345 L st., Washington, D. C.
BROWN, FRANK N.....100 State st., Chicago, Ill.
BROWN, G. V. I.....Milwaukee Medical College, Milwaukee, Wis.
BURKHART, H. J.....Batavia, N. Y.
*BURKHART, W. E.....930 Pacific ave., Tacoma, Wash.
BUTLER, C. S.....580 Main st., Buffalo, N. Y.
CANFIELD, L. D.....320 Huron st., Toledo, Ohio.
*CANNADAY, J. W.....583 State st., Albany, N. Y.
CARR, ELLEN R.....26 Pratt st., Hartford, Conn.
CARR, WM.....35 W. 46th st., New York, N. Y.
*CASSIDY, J. S.....732 Madison ave., Covington, Ky.
dCATTELL, DAVID M.....92 State st., Chicago, Ill.
CHAMBERS, W. T.....California Bldg., Denver, Col.
*CHASE, EMMA EAMES.....3334 Washington ave., St. Louis, Mo.
CHITTENDEN, C. C.....21 W. Main st., Madison, Wis.
*CLANCY, W. D.....437 W. 7th st., Cincinnati, Ohio.
*CLAPP, DWIGHT M.....130 Commonwealth ave., Boston, Mass.
CLAUDE, G. H.....22 State Circle, Annapolis, Md.
*CLIFTON, W. R.....Waco, Texas.
COCKERILLE, S. J.....Washington, D. C.
COGAN, WM. N.....1746 M st., N. W., Washington, D. C.
COLLINS, J. H.....Granville, N. Y.
*COMBS, J. W.....New Braunfels, Texas.
*COMEGYS, E. F.....Gainesville, Texas.
*CONRAD, WM.....321 N. Grand ave., St. Louis, Mo.
*COOK, C. D.....162 Remsen st., Brooklyn, N. Y.
COOK, GEO. W.....47th st. and Kenwood ave., Chicago, Ill.
*CORLEY, J. P.....Greensboro, Ala.
CRAVENS, J. E.....Indianapolis, Ind.
CRAWFORD, J. Y.....Jackson Bldg., Nashville, Tenn.
CRENSHAW, WM.....Atlanta, Ga.
CROUSE, J. N.....2231 Prairie st., Chicago, Ill.
CRUZEN, E. E.....1213 Madison ave., Baltimore, Md.
CULVER, M. B.....1529 Locust st., Philadelphia, Pa.
CUSTER, L. E.....Dayton, Ohio.
*DALE, J.A.....217 N. Summer st., Nashville, Tenn.
DARBY, E. T.....1513 Walnut st., Philadelphia, Pa.
*DAVENPORT, I. B.....30 Rue de l'Opera, Paris, France.
*DAVID, J. W.....Mexia, Texas.
DAVIS, L. F.....1108 New York ave., N. W., Washington, D. C.
*DEWEY, S. B.....29 Euclid ave., Cincinnati, Ohio.
*DICKINSON, W. P.....Andrus Bldg., Minneapolis, Minn.
*DIXON, SOUTHALL.....Bolivar, Tenn.
DONNALLY, WILLIAMS.....1022 14th st., N. W., Washington, D. C.
DOTTERER, L. P.....102 Broad st., Charleston, S. C.

DOWSLEY, J. F.....175 Tremont st., Boston, Mass.
*DOYLE, B. OSCAR.....206 W. Chestnut st., Louisville, Ky.
DUFF, SAMUEL G.....Greenville, Texas.
*DUNBAR, L. L.....606 Sutter st., San Francisco, Cal.
DUNN, J. AUSTIN.....901 Marshall Field Bldg., Chicago, Ill.
*EBERLE, EDWARD.....Sage-Allen Bldg., Hartford, Conn.
*ELLIOTT, W. ST. GEO.....651 Madison ave., New York, N. Y.
*ESSIG, CHAS. J.....1700 Locust st., Philadelphia, Pa.
*EVANS, GEO.....55 W. 39th st., New York, N. Y.
EVANS, W. W.....1756 M st., Washington, D. C.
*EVERITT, D. E.....Raleigh, N. C.
*EWALL, W. H.....215 N. High st., Portsmouth, Va.
*FARRAR, J. N.....1271 Broadway, New York, N. Y.
*FAUGHT, L. ASHLEY.....1415 Walnut st., Philadelphia, Pa.
*FERRIS, H. C.....1108 Bergen st., Brooklyn, N. Y.
*FIELD, GEORGE L.....Abstract Bldg., Detroit, Mich.
*FIFE, J. G.....Dallas, Texas.
FILLEBROWN, THOS.....157 Newburry st., Boston, Mass.
FINLEY, M. F.....1928 I st., N. W., Washington, D. C.
FINNEY, W. B.....Baltimore, Md.
*FLANNAGAN, A. J.....352 Main st., Springfield, Mass.
FONES, ALFRED C.....949 Main st., Bridgeport, Conn.
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FOSTER, S. W.....Inman Bldg., Atlanta, Ga.
*FRAZER, J. E.....Birmingham, Ala.
*FREEMAN, S.....965 Madison ave., New York, N. Y.
*FREEMAN, S. A.....641 Main st., Buffalo, N. Y.
*FROST, E. D.....Elizabeth, N. J.
*FRUTH, O. J.....3066 Hawthorne Boulevard, St. Louis, Mo.
FULLER, A. H.....Cor. 8th and Locust sts., St. Louis, Mo.
FUNDENBERG, W. H.....Lewis Bldg., Pittsburg, Pa.
GALLUP, MARY E.....711 Boylston st., Boston, Mass.
GARDINER, FRANK D.....1516 Locust st., Philadelphia, Pa.
GARDINER, FRANK H.....31 Washington st., Chicago, Ill.
GAYLORD, ALBERT N.....1831 Chestnut st., Philadelphia, Pa.
GAYLORD, E. S.....63 Trumbull st., New Haven, Conn.
GILBERT, L. S.....491 Mack Block, Denver, Col.
GILBERT, S. E.....1627 Columbia ave., Philadelphia, Pa.
*GILMER, THOS. L.....126 State st., Chicago, Ill.
*GODDARD, C. L.....406 Sutter st., San Francisco, Cal.
*GOLDSMITH, S. L.....129 E. 60th st., New York, N. Y.
*GOOD, ROBERT.....102 State st., Chicago, Ill.
*GOODWIN, N. J.....753 Main st., Hartford, Conn.
GORE, A. P.....1006 Madison ave., Baltimore, Md.
GORMAN, J. A.....Paragon Bldg., Asheville, N. C.

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GRADY, RICHARD.....Naval Academy, Annapolis, Md.
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GROSS, O. J.....77 Ferry st., Schenectadv, N. Y.
*GUILFORD, S. H.....1728 Chestnut st., Philadelphia, Pa.
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*HARPER, W. E.....3456 Wabash ave., Chicago, Ill.
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*HART, R. J.....Janesville, Wis.
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*HARVEY, HARRY T.....Trump Bldg., Battle Creek, Mich.
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*HEAD, JOS.....1415 Walnut st., Philadelphia, Pa.
HERTZ, J. C.....111 S. 4th st., Easton, Pa.
*HINKINS, J. E.....131 Fifty-third st., Chicago, Ill.
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*JACKSON, H. H.....317 Jefferson st., Detroit, Mich.
JACKSON, VICTOR H.....240 Lenox ave., New York, N. Y.
*JACKSON, WALTER H.....403 E. Liberty st., Ann Arbor, Mich.
*JAMESON, G. L. S.....1517 Walnut st., Philadelphia, Pa.

*JARVIE, WILLIAM ..... 105 Clinton st., Brooklyn, N. Y.
*JEFFERIS, C. R..... 1016 Delaware ave., Wilmington, Del.
JEWETT, H. R..... 313 The Grand, Atlanta, Ga.
JOHNSON, C. N..... 31 Washington st., Chicago, Ill.
JOHNSON, H. H..... 306 Second st., Macon, Ga.
JONES, BUSH ..... Linz Bldg., Dallas, Texas.
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JONES, VICTOR S..... Bethlehem, Pa.
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KNAPP, MILAND A..... 210-11 Dayton Bldg., Minneapolis, Minn.
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*LYONS, W. A..... 1400 H st., Washington, D. C.
*MCANNALLY, F. H..... Jasper, Ala.
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MCMANUS, HENRY..... 80 Pratt st., Hartford, Conn.
MCMANUS, JAS..... 80 Pratt st., Hartford, Conn.

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*MARTIN, W. T. ..... Yazoo City, Miss.
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PARR, H. A. ..... New York, N. Y.
PARRAMORE, T. H. ..... Hampton, Va.
PATTERSON, J. D. ..... Keith & Perry Bldg., Kansas City, Mo.
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PRESSEY, J. B. ..... Hampton, Va.
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PROSSER, A. J. ..... 3901 Westminster Place. St. Louis, Mo.

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*REAVIS, J. L.....La Grande, Ore.
*REITZ, R. B.....224 East 58th st., New York, N. Y.
*REMINGTON, F. A.....57 West 59th st., New York, N. Y.
RHEIN, MEYER L.....38 E. 61st st., New York, N. Y.
*RICHTER, R. G.....128 Wisconsin st., Milwaukee, Wis.
RIGGS, C. H.....902 Main st., Hartford, Conn.
ROBERTS, H. E.....1516 Locust st., Philadelphia, Pa.
*ROBERTS, NORMAN J.....Waukegan, Ill.
ROBINSON, C. H.....Main st., Wabasha, Minn.
*ROHLAND, C. B.....123 3d st., Alton, Ill.
RUTLEDGE, B.....Box 45, Florence, S. C.
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SAVAGE, GEO. E.....578 Main st., Worcester, Mass.
*SCHMIDT, JNO. A.....1195 Deane st., Brooklyn, N. Y.
*SEIP, HOWARD S.....Allentown, Pa.
*SHEPARD, L. D.....330 Dartmouth st., Boston, Mass.
SHIELDS, NELSON T.....154 Madison ave., New York, N. Y.
*SHRIVER, H. W.....15th and Farnam sts., Omaha, Neb.
SHRYOCK, WM. W.....27 W. Berry st., Ft. Wayne, Ind.
*SIBLEY, A. H.....1214 Filbert st., Philadelphia, Pa.
*SILL, CHAS.....301 N. 12th st., New York, N. Y.
SIMPSON, G. L.....Westinghouse Bldg., Pittsburg, Pa.
SIMPSON, I.....Rock Hill, S. C.
SINTON, W. K.....3 El Paso Block, Colorado Springs, Col.
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*SLATER, W. K.....Knoxville, Tenn.
SMITH, B. HOLLY.....1007 Madison ave., Baltimore, Md.
*SMITH, D. D.....1629 Walnut st., Philadelphia, Pa.
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SMITH, G. MARSHALL.....1009 Madison ave., Baltimore, Md.
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SMITH, H. T.....116 Garfield Place, Cincinnati, Ohio.
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*Straight, M. B.....80 W. Huron st., Buffalo, N. Y.
*Stubblefield, D. R.....Willcox Bldg., Nashville, Tenn.
*Summerlin, W. A.....Mt. Vernon, Va.
*Sutphin, H. S.....24 E. Kinney st., Newark, N. J.
Talbott, Robt. W.....1111 F st., Washington, D. C.
Taylor, L. C.....26 Pratt st., Hartford, Conn.
*Teague, B. H.....Aiken, S. C.
*Thomas, J. D.....1112 Walnut st., Philadelphia, Pa.
*Thompson, A. H.....721 Kansas ave., Topeka, Kan.
Tileston, H. B.....New Equitable Bldg., Louisville, Ky.
*Townsend, A. F.....11 Pleasant st., Worcester, Mass.
Tracy, W. D.....46 W. 37th st., New York, N. Y.
Truman, Jas.....4505 Chester ave., Philadelphia, Pa.
Tucker, E. J.....Roxboro, N. C.
Turner, C. R.....407 E. Main st., Richmond, Va.
Turner, M. E.....719 Prudential Bldg., Atlanta, Ga.
Turner, V. E.....107½ Fayetteville st., Raleigh, N. C.
Van De Water, J. N.....Madison, N. J.
*Van Vleck, Chas. C.....536 Warren st., Hudson, N. Y.
*Vann, Geo. S.....Gadsden, Ala.
*Vignes, C. V.....New Orleans, La.
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Walker, R. H.....231 Main st., Norfolk, Va.
Walker, W. E.....Box 51, Pass Christian, Miss.
*Walker, W. W.....58 West 50th st., New York, N. Y.
Warner, E. R.....401 California Bldg., Denver, Col.
*Wassall, J. W.....711 Stewart Bldg., Chicago, Ill.
Waters, T. S.....756 Eutaw st., Baltimore, Md.
*Watkins, S. C. G.....Montclair, N. J.
Wedelstaedt, E. K.....204 N. Y. Life Bldg., St. Paul, Minn.
Weeks, Thos. E.....Dayton Bldg., Minneapolis, Minn.
Welch, John.....80 E. 16th st., Portland, Ore.
*Wendell, W. C.....708 Goldsmith Bldg., Milwaukee, Wis.
Wheeler, Herbert L.....518 Main st., Worcester, Mass.
*Whitby, T. P.....Vaught Bldg., Selma, Ala.
White, Gordon.....Church st., Nashville, Tenn.
White, W. A.....Phelps, N. Y.
*Whitfield, Geo. M.....6215 S. th st., Newark, N. J.
*Whitslar, W. H.....29 Euclid ave., Cleveland, Ohio.
*Wilkinson, Jno. E.....402 Sherbourne st., Toronto, Can.
*Williams, P. H.....Way Cross, Ga.
*Williams, Jacob L.....4 Walnut st., Boston, Mass.
*Willmott, W. E.....41 Shuter st., Toronto, Can.
*Wilson, F. C.....12 Jones st., Savannah, Ga.
Wilson, George H.....44 Euclid ave., Cleveland, Ohio.
Wilson, I. P.....317 N. 4th st., Burlington, Iowa.
*Wilson, P. J.....44 Nassau st., Princeton, N. J.

*WRIGHT, A. M.....38 3d st., Troy, N. Y.
*WRIGHT, B. E.....Dekum Bldg., Portland, Ore.
*WRIGHT, E. R.....203 Main st., Richmond, Va.
WRIGHT, J. J.....605 Matthews Bldg., Milwaukee, Wis.
WYATT, T. M.....Bentonville, Ark.
YERKES, H. P.....Doylestown, Pa.

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MCKELLOPS, H. J.....3548 Lindell ave., St. Louis, Mo.
MORGAN, W. H.....211 High st., Nashville, Tenn.
PALMER, CORYDON.....Warren, Ohio.
PALMER, S. B.....225 S. Warren st., Syracuse, N. Y.
TAFT, J.....Berkshire Bldg., Cincinnati, Ohio.

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BURR, W. H.....Madison, Ga.
CARPENTER, L. D.....Atlanta, Ga.
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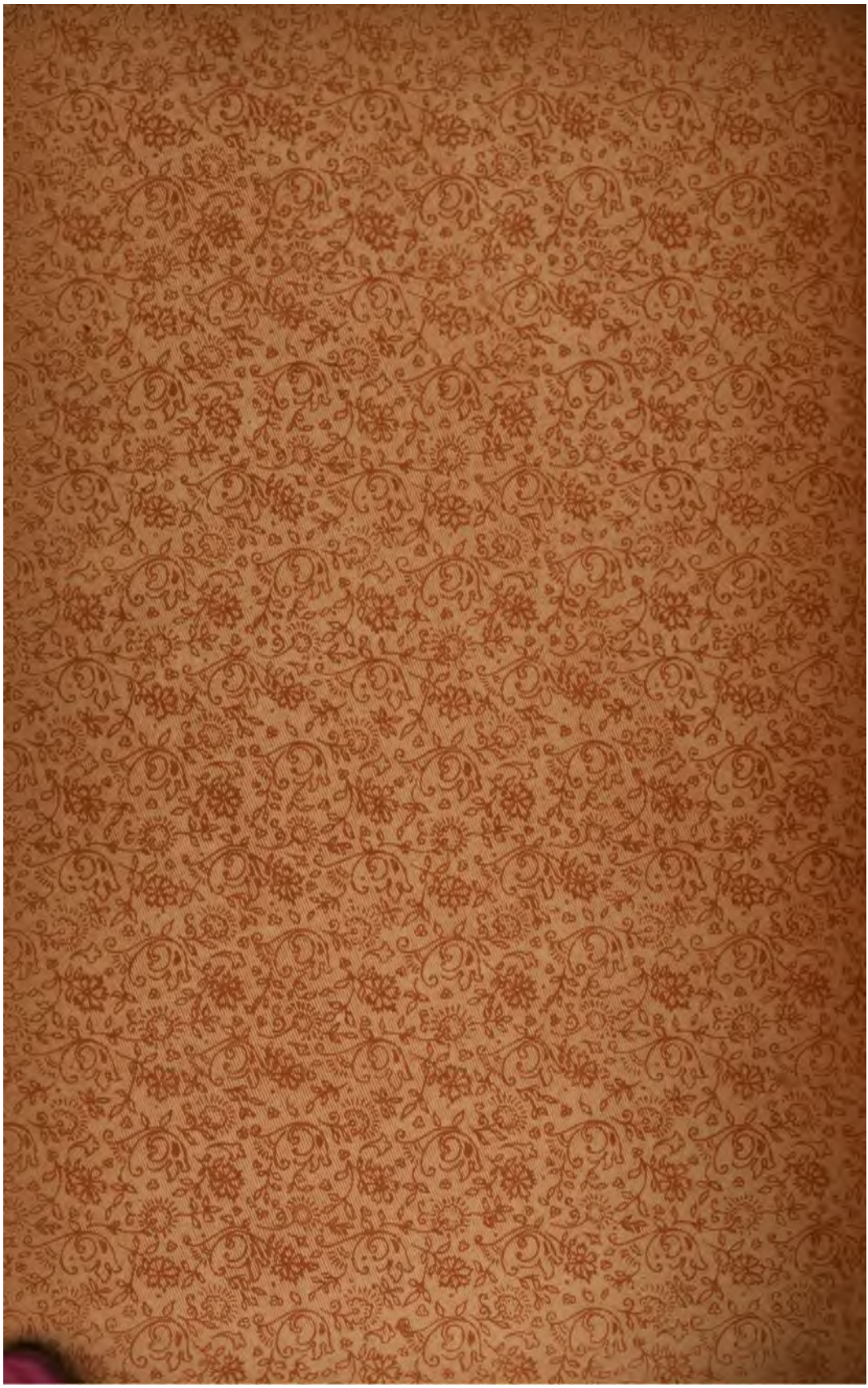
COLE, W. T.....Newnan, Ga.
COOKE, W. H.....Denton, Texas.
FRIEDRICHS, G. J.....641 St. Charles ave., New Orleans, La.
GORGAS, F. J. S.....259 N. Eutaw st., Baltimore, Md.
HOLLAND, SIDNEY G.....Atlanta, Ga.
KNAPP, J. S.....New Orleans, La.
LOWRANCE, H. A.....Athens, Ga.
MCDONALD, R. H.....Griffin, Ga.
MARSHALL, E. B.....Medical Bldg., Rome, Ga.
MORGAN, W. H.....211 High st., Nashville, Tenn.
RAMBO, SAMUEL.....Montgomery, Ala.
TIGNER, J. A.....Rome, Ga.

States Represented by Membership in Good Standing, February 20, 1901.

New York	46	Georgia	20
Illinois	27	Massachusetts	17
Ohio	19	District of Columbia	15
Maryland	16	Tennessee	15
New Jersey	15	Connecticut	12
Virginia	13	North Carolina	9
Missouri	11	Minnesota	8
Wisconsin	9	Alabama	9
Texas	10	Kentucky	6
South Carolina	9	Louisiana	7
California	6	Indiana	6
Colorado	6	Oregon	4
Michigan	6	Arkansas	3
Nebraska	3	Iowa	3
Canada	4	Rhode Island	2
Mississippi	4	Delaware	1
Florida	2	Kansas	1
Philippine Islands	1	Washington	1
France	1		
Pennsylvania	36	Total	386



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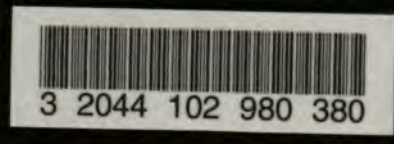
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